ENVIRONMENTAL ASSESSMENT

Farallon De Medinilla and Tinian Military Lease Areas

Commonwealth of the Northern Mariana Islands

Integrated Natural Resources Management Plan

July 2004

Report Documentation Page

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DEPARTMENT OF DEFENSE
DEPARTMENT OF THE NAVY

FINDING OF NO SIGNIFICANT IMPACT (FONSI) FOR ENVIRONMENTAL ASSESSMENT (EA) FOR IMPLEMENTATION OF AN INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) FOR THE FARALLON DE MEDINILLA (FDM) AND TINIAN MILITARY LEASE AREAS (MLAs) LOCATED IN THE COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS (CNMI)

Pursuant to the National Environmental Policy Act of 1969 (42 USC §4321, et seq.), as implemented by the Council on Environmental Quality regulations (40 CFR Parts 1500-1508) the Office of the Chief of Naval Operations Instruction 5090.1B Change-4 and the Department of Navy Procedures for Implementing the National Environmental Policy Act (32 CFR Part 775), the Department of the Navy gives notice that an EA has been prepared and an Environmental Impact Statement is not required for implementing the INRMP for FDM and Tinian MLAs.

Proposed Action: The Proposed Action is to implement the INRMP for FDM and Tinian MLAs. The MLAs are located on United States Department of Defense (DoD) controlled lands within the CNMI that have been and are used for military training. The Proposed Action fulfills the requirements of the Sikes Act Improvement Act (SAIA) (16 USC §670a et seq.) and represents an ecosystem-based approach to natural resources management on the MLAs. The INRMP projects were developed in cooperation with the United States Fish and Wildlife Service (USFWS) and the CNMI Division of Fish and Wildlife. The proposed projects focus on actions that either (1) protect threatened or endangered (T/E) species; or (2) provide additional knowledge of T/E species and their habitat to enable future sound management decisions. The Proposed Action consists of projects that meet INRMP goals and objectives within four natural resource management categories: Forest Management; Fish and Wildlife Management; Land Management; and Outdoor Recreation Management and are required to meet Federal and local regulatory requirements. The approach of the NEPA analysis is "programmatic," in that it evaluates alternative strategies for managing the natural resources of the FDM and Tinian MLAs. Specific projects are proposed for the Proposed Action and alternatives; however, the intent is to capture overall impacts in a broad sense.

Alternatives Analyzed: Alternatives considered were an Enhanced Alternative and the No Action Alternative. In addition to projects identified for the Proposed Action, the Enhanced Alternative would implement projects that are required by DoD and Navy policy decisions or initiatives. The No Action Alternative would not adopt the INRMP for the FDM and Tinian MLAs. The multiple-use objectives identified in the 1997 Tinian Natural Resources Management Plan would be the guiding natural resources management document for the Tinian MLA. No natural resources management plan exists or would be adopted for the FDM MLA. Only projects identified as required or recommended in existing USFWS Biological Opinions would be programmed for execution. The No Action Alternative would not comply with the SAIA.

Environmental Effects: The Proposed Action provides a beneficial impact to natural resources, specifically biological resources of the MLAs, while supporting the military mission. The Proposed Action would have a beneficial effect on T/E species. No impacts are anticipated to visual, cultural, physical, economic, or social resources. The Proposed Action would not create environmental health and safety risks that may disproportionately affect children and minority or disadvantaged populations. The Navy has determined that the Proposed Action would not have reasonably foreseeable direct and indirect effects on any coastal use or resource of the CNMI

coastal zone. The Navy has completed informal Section 7 consultation with the USFWS. The USFWS concurred that the Proposed Action would be beneficial to T/E species. No cumulative adverse impacts are anticipated as a result of any of the alternatives.

Findings: Based on information gathered during the preparation of the EA, the Navy finds that the Proposed Action, implementation of the INRMP for FDM and Tinian MLAs, will not significantly impact human health or the environment.

The EA and FONSI prepared by the Navy addressing this Proposed Action is on file and interested parties may obtain a copy from: Commander, Naval Facilities Engineering Command, Pacific, 258 Makalapa Drive, Suite 100, Pearl Harbor, Hawai'i 96860-3134 (Attention: Ms. Paulette Chang, ENV1831 PC), telephone (808) 472-1383. A limited number of copies are available to fill single copy requests.

23 Aug 2004

Date

C. E. WEAVER
Rear Admiral, U.S. Navy
Commander, Navy Installations Command

ENVIRONMENTAL ASSESSMENT

Farallon De Medinilla and Tinian Military Lease Areas

Commonwealth of the Northern Mariana Islands

Integrated Natural Resources Management Plan

July 2004

COVER SHEET

Proposed Action The Department of the Navy proposes to implement an Integrated Natural Resources Management Plan (INRMP) for the Farallon de Medinilla (FDM) and Tinian Military Lease Areas (MLAs) located in the Commonwealth of the Northern Mariana Islands (CNMI).

Document Environmental Assessment (EA)

Lead Agency Commander, United States Naval Forces, Marianas (COMNAVMARIANAS)

For Further Information

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Summary

This EA documents the Navy's compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code (USC) §4321, et seq.), as implemented by the Council on Environmental Quality regulations (40 CFR Parts 1500-1508), the Office of the Chief of Naval Operations Instruction 5090.1B Change-4 and the Department of Navy Procedures for Implementing the National Environmental Policy Act (32 CFR Part 775).

The Department of the Navy proposes to implement an INRMP for the FDM and Tinian MLAs in CNMI. The INRMP is required by the Sikes Act Improvement Act (16 USC §670a et seq.), and is a plan for the management, conservation and rehabilitation of natural resources within the MLAs. The INRMP integrates military mission requirements with stewardship of the natural resources.

The approach of the NEPA analysis is "programmatic," in that it evaluates alternative strategies for managing the natural resources of the FDM and Tinian MLAs. Specific projects are proposed for the Proposed Action and alternatives; however, the intent is to capture overall impacts in a broad sense.

The Proposed Action consists of projects to meet INRMP goals and objectives within four natural resource management categories: Forest Management; Fish and Wildlife Management; Land Management; and Outdoor Recreation Management. The Proposed Action implements projects required to meet Federal and local regulatory requirements. Alternatives considered include an Enhanced Alternative and a No Action Alternative. In addition to projects identified for the Proposed Action, the Enhanced Alternative would implement projects that are required by DoD and Navy policy decisions or initiatives but that are not mandated by Federal and local regulatory requirements.

The Proposed Action and the alternatives would each provide a level of beneficial impact to natural resources, specifically biological resources of the MLAs, while supporting the military mission. No significant adverse impacts are anticipated from the implementation of any of the alternatives, and no mitigation is required. None of the alternatives would: 1) adversely impact threatened and endangered (T/E) species; 2) affect sensitive habitat or habitat critical to the existence of any T/E species; or 3) negatively change the distribution or reduce the population of any species of value. No impacts are anticipated to visual, cultural, physical, economic, or social resources.

The Proposed Action would not create environmental health and safety risks that may disproportionately affect children and minority or disadvantaged populations. The Navy has conducted an effects test and concluded the Proposed Action would not have reasonably foreseeable direct and indirect effects on any coastal use or resource of the CNMI coastal zone. The Navy has completed an informal Section 7 consultation with the United States Fish and Wildlife Service. No cumulative adverse impacts are anticipated as a result of any of the alternatives.

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ABBREVIATIONS AND ACRONYMS

ac – acre

BO – Biological Opinion

BTS – Brown Tree Snake

BTS Plan – BTS Control/Interdiction Plan for Military Training Exercises

CEQ – Council on Environmental Quality

CFR – Code of Federal Regulations

CNMI – Commonwealth of the Northern Mariana Islands

CNO – The Office of the Chief of Naval Operations

COMNAVMARIANAS – Commander, United States Naval Forces Mariana Islands

CZMA – Coastal Zone Management Act of 1972 (16 USC 1451 et seq.)

DFW – Division of Fish and Wildlife

DoD – United States Department of Defense

EA – Environmental Assessment

EIS – Environmental Impact Statement

EO – Executive Order of the Office of the President of the US

ESA – Endangered Species Act of 1973, as amended (16 USC 1531 et seq.)

FDM – Farallon de Medinilla

FONSI – Finding of No Significant Impact

ha – hectare

INRMP – Integrated Natural Resources Management Plan

Marianas – Mariana Islands

m – meter

MBTA – Migratory Bird Treaty Act

MLA – Military Lease Area

MOU – Memorandum of Understanding

MTP – Marianas Training Plan for DoD Facilities and Activities (1998)

MTP EIS – United States Pacific Command, Military Training in the Marianas, Final Environmental Impact Statement (1999)

Navy – United States Department of the Navy

ABBREVIATIONS AND ACRONYMS (continued)

NAVFAC PACIFIC – Naval Facilities Engineering Command, Pacific NEPA – National Environmental Policy Act (42 USC §4321 et seq.)

NHPA – National Historic Preservation Act (16 USC §470)

NMFS – US Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service

NRMP – Natural Resources Management Plan

OPNAVINST – Office of the Chief of Naval Operations Instruction

PACOM – US Pacific Command

SAIA – Sikes Act Improvement Act (16 USC §670a et seq.)

T/E – Threatened or Endangered

USC – United States Code

USGS – United States Geological Survey

USFWS – United States Fish and Wildlife Service

UXO – Unexploded Ordnance

VoA – Voice of America

EXECUTIVE SUMMARY

This Environmental Assessment evaluates the environmental impacts of adopting an Integrated Natural Resources Management Plan (INRMP) for military lease areas (MLAs) on Farallon de Medinilla (FDM) and Tinian, and implementing related natural resources management projects. The MLAs involved are located on United States Department of Defense (DoD) controlled lands within the Commonwealth of the Northern Marianas Islands (CNMI) that have historically been used for military training. The Proposed Action meets the requirements of the Sikes Act Improvement Act (SAIA) (16 USC §670a et seq.) and represents an ecosystem-based approach to natural resources management on the MLAs. The INRMP projects were developed in cooperation with the United States Fish and Wildlife Service (USFWS) and the CNMI Division of Fish and Wildlife. The proposed projects focus on actions that either (1) protect threatened or endangered (T/E) species; or (2) provide additional knowledge of T/E species and their habitat to enable future sound management decisions.

The Proposed Action consists of projects to meet INRMP goals and objectives within four natural resource management categories: Forest Management; Fish and Wildlife Management; Land Management; and Outdoor Recreation Management. The Proposed Action implements projects that are required to meet Federal and local regulatory requirements. These projects are a funding priority and are considered Navy Level 1 projects (i.e., required by laws or regulations).

In addition to the Proposed Action, two alternatives were evaluated: the Enhanced Alternative, and the No Action Alternative. In addition to projects identified for the Proposed Action, the Enhanced Alternative will also incorporate the implementation of projects that are required under DoD and Navy policy decisions or initiatives, but that are not mandated by Federal and local regulatory requirements. Because the additional projects are not mandated by regulatory requirements, the projects are categorized as lower funding priority and are considered Navy Level 2 projects. There is little assurance that Navy Level 2 projects would be funded in any particular year; therefore, commitment to their execution is uncertain.

The No Action Alternative would not adopt the INRMP for the FDM and Tinian MLAs. The multiple-use objectives identified in the 1997 Tinian Natural Resources Management Plan would be the guiding natural resources management document for the Tinian MLA. No natural resources management plan exists or would be adopted for the FDM MLA. Only projects identified as required or recommended in existing USFWS Biological Opinions would be programmed for execution. The No Action Alternative would not comply with the SAIA.

None of the alternatives would: 1) adversely impact T/E species; 2) affect sensitive habitat or habitat critical to the existence of any T/E species; or 3) negatively change the distribution or reduce the population of other species of value. No impacts are anticipated to other resources including visual, cultural, physical, economic, or social. The Proposed Action would not create environmental health and safety risks that may disproportionately affect children and minority or disadvantaged populations. The Navy has conducted an effects test and concluded the Proposed Action would not have reasonably foreseeable direct and indirect effects on any coastal use or resource of the CNMI coastal zone; therefore, no further documentation is required to be sent to the CNMI Coastal Resources Management Office. The Navy has completed informal Section 7 consultation with the USFWS. USFWS concurred that the Proposed Action would be beneficial to T/E species. No cumulative adverse impacts are anticipated as a result of any of the alternatives.

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

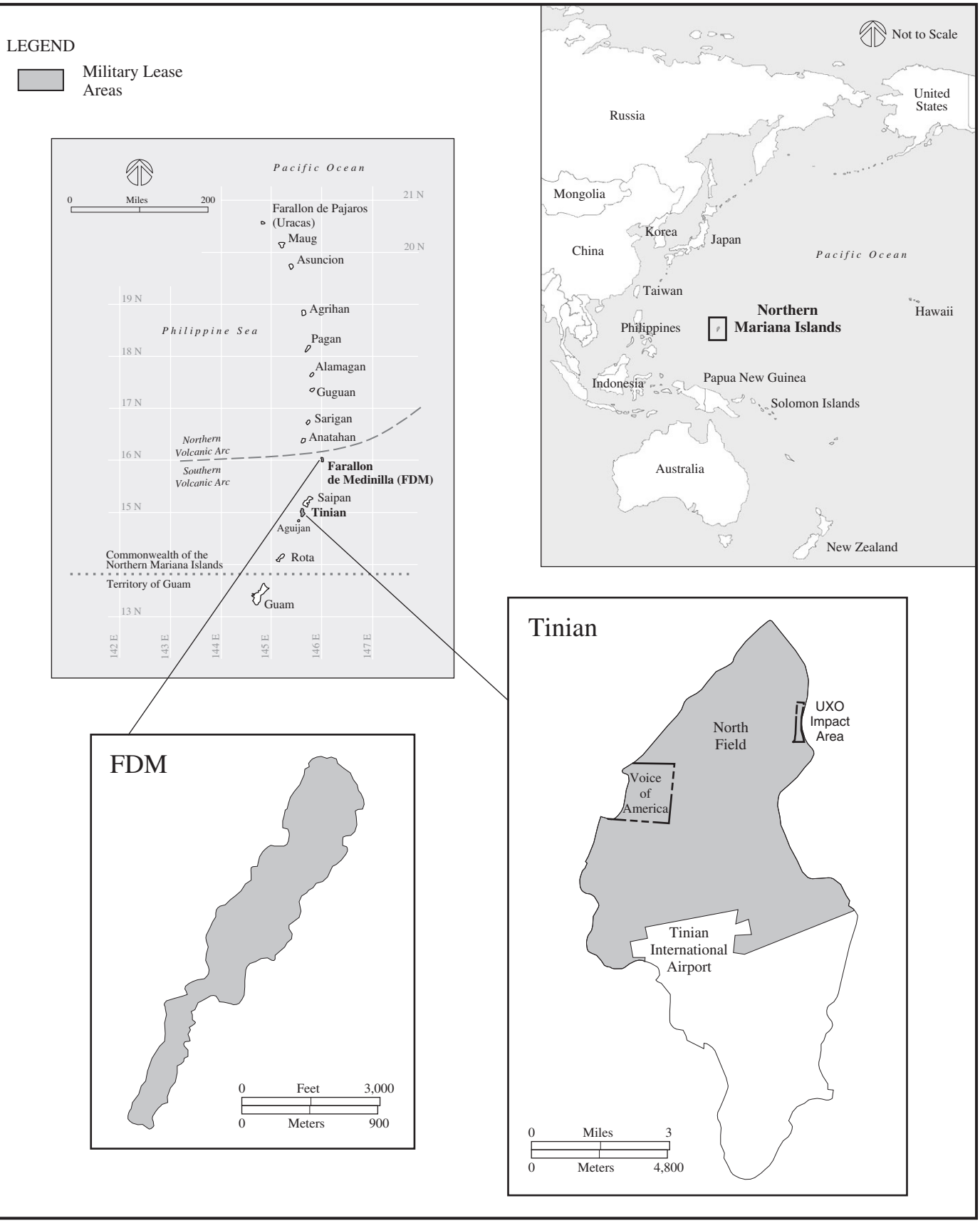
The United States Department of the Navy (Navy) proposes to update the existing Natural Resources Management Plan (NRMP) for the Tinian Military Lease Area (MLA) (NAVFAC EFD PACIFIC, 1997) to meet the Sikes Act Improvement Act (SAIA) (16 USC §670a et seq.). The Navy also proposes to add the Farallon de Medinilla (FDM) MLA to the plan. Both MLAs are located within the Commonwealth of the Northern Mariana Islands (CNMI) and are shown on Figure 1. The updated plan would be an Integrated Natural Resources Management Plan (INRMP) consistent with the military use of the MLAs, and the goals and objectives established in the SAIA. The INRMP would describe the existing condition of the natural resources, identify natural resources issues, concerns, goals, and objectives, and propose a nine-year natural resources management program that would support the military mission while protecting and enhancing the natural resources. The INRMP would identify planned management and monitoring actions, and the Navy's overall conservation priorities. The INRMP would be reviewed annually, revised as needed, and re-approved every five years.

The Navy based its natural resources management program on the following:

- Evaluation of all relevant and identifiable long term and short term ecological and economic consequences;
- Coordination with the United States Fish and Wildlife Service (USFWS) and the CNMI Division of Fish and Wildlife (DFW);
- Public comments;
- Current knowledge of science; and
- The principles of ecosystem-based and adaptive management.

This Environmental Assessment (EA) evaluates the environmental effects of the INRMP and is intended to comply with the following requirements and guidance documents:

- National Environmental Policy Act (NEPA) (42 United States Code (USC) §4321 et seq.), as implemented by the Council on Environmental Quality (CEQ) regulations (Title 40 Code of Federal Regulations (CFR) Parts 1500-1508);
- The Office of the Chief of Naval Operations Instruction (OPNAVINST) 5090.1B Change-4, Environmental and Natural Resources Program Manual of June 4, 2003;
- Navy's Procedures for Implementing the National Environmental Policy Act (32 CFR Part 775); and
- Navy's Guidance on Preparing National Environmental Policy Act Documents for INRMPs (Office of the Chief of Naval Operations (CNO), November 30, 1998).



Location Map

Environmental Assessment FDM and Tinian MLAs INRMP

Figure 1

The EA evaluates the physical, biological, and socioeconomic environmental impacts of adopting and implementing the INRMP for the FDM and Tinian MLAs. It is intended to provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact (FONSI) for the INRMP. This EA analyzes the potential impacts of the Proposed Action and alternatives.

1.2 LOCATION

As shown on Figure 1, Tinian and FDM are located within CNMI. The MLAs, indicated by shading, encompass all land areas of FDM and the northern portion of Tinian. The MLAs include the land area and "nearshore waters," which are not clearly defined in the lease agreements. The Navy does not have marine resource management responsibility; however, the INRMP would address impacts on those marine resources that are dependent upon intertidal waters for nesting or foraging.

No public access is allowed on the FDM MLA. The majority of the Tinian MLA is accessible to the public, except during training exercises. Off-limits areas at the Tinian MLA include an area of unexploded ordnance (UXO) on the eastern coast and the Voice of America (VoA) site on the western coast.

1.3 PURPOSE AND NEED

FDM and Tinian MLAs include diverse ecosystems that support Federally listed threatened and endangered (T/E) species, and other native fauna and plant communities. The Commander, United States Naval Forces Marianas (COMNAVMARIANAS), representing Commander, United States Pacific Command (PACOM), is responsible for supporting military training in the Marianas that is necessary to develop and maintain war fighting skills and a constant state of readiness in the military forces. The potential impacts of United States Department of Defense (DoD) use of leased lands in the CNMI for military training are documented in the *Final Environmental Impact Statement for Military Training in the Marianas* (MTP EIS) (NAVFAC PACIFIC, 1999). Managing, protecting, and enhancing the native ecosystems on leased lands is essential to sustaining a realistic training environment and protecting T/E species that inhabit these two MLAs.

A NRMP for Tinian was adopted in June 1997. There is no NRMP for the FDM MLA. The SAIA requires that all DoD installations with natural resources have INRMPs that provide for the cooperative management of natural resources on its lands among the DoD, USFWS, and State fish and wildlife management agencies.

The purpose and need of the Proposed Action is to integrate natural resources management practices within the FDM and Tinian MLAs to comply with the SAIA while meeting the military mission. The objective of the Proposed Action is to describe the existing condition of the natural resources and to identify potential natural resources management projects that would protect and enhance the native ecosystems within the

leased areas in an updated INRMP for the Tinian and FDM MLAs. The potential natural resources management strategies and projects identified in the INRMP and discussed in this EA reflect the mutual fish and wildlife management objectives of the DoD, USFWS, and CNMI DFW.

1.4 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

The DoD proposes to adopt and implement an ecosystem-based INRMP for approximately 206 acres (ac) (83 hectares (ha)) of MLA on FDM and approximately 15,347 ac (6,211 ha) of MLA on Tinian including the implementation of natural resources projects between fiscal years 2004 to 2012. The content of the NEPA analysis is "programmatic" in that it evaluates alternative programs for managing the MLAs' natural resources. Specific projects are proposed for the Proposed Action and alternatives; however, the intent is to assess their overall impacts in a broad sense. The projects provide a framework for reviewing changes to ongoing natural resources management practices. A programmatic approach provides the installation's Natural Resource Manager an opportunity to accommodate unforeseen projects and changes to projects as long as they are consistent with the goals and objectives of the INRMP. Additional project-specific NEPA documentation may be required prior to implementation of individual projects. Examples of projects that may require additional NEPA documentation include sea turtle tagging projects and feral animal eradication projects. Budgets for projects that may have potential adverse impacts would need to include the cost to prepare NEPA documents.

The INRMP would describe the existing environments of both MLAs, identifies potential threats to ecosystem health, and proposes Navy projects to address threats to the ecosystems. The Proposed Action and alternatives are described in terms of four management areas, as follows:

- Forest Management – Actions designed for the production and sale of forest products and for maintaining the health and vigor of forest ecosystems. Actions include timber management, forest administration, timber sales, reforestation, afforestation, timber stand improvement, timber access road construction and maintenance, and other directly related functions; and for maintaining the health and vigor of forest ecosystems.
- Fish and Wildlife Management – Actions designed to preserve, enhance and regulate indigenous wildlife and its habitats, including conservation of protected species, and non-game species, management and harvest of game species, Bird Aircraft Strike Hazard reduction and animal damage control.
- Land Management – Programs and techniques to manage lands, wetlands, and water quality, including soil conservation, erosion control, and non-point source pollution, surface and subsurface waters, habitat restoration, control of noxious weed and

poisonous plants, agricultural outleasing, range management, identification and protection of wetlands, watersheds, floodplains management, landscaping, and ground maintenance.

- Outdoor Recreation Management – Management of natural resources to provide recreation opportunities that are sustainable, within the military mission, within established carrying capacities, and consistent with the natural resources upon which they are based.

1.5 FEDERAL AND CNMI CONSULTATION

The SAIA requires that INRMPs be developed in cooperation with the USFWS and State fish and wildlife agencies. Both the USFWS and CNMI DFW were involved in the development of the INRMP by participating in scoping meetings, suggesting natural resources management projects, and commenting on drafts of the INRMP. The cooperative development of the Final INRMP for MLAs on FDM and Tinian will be documented in the INRMP (NAVFAC PACIFIC, 2004).

Additional agency consultation may be required for implementing the INRMP-specific natural resources management projects. The Federal consultations may include the following:

- Section 7 consultation under the Endangered Species Act (ESA) (16 USC §1531). Section 7(a) of the ESA requires that each Federal agency, in consultation with the USFWS and National Marine Fisheries Service (NMFS), ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any Federally listed T/E species or result in the destruction or adverse modification of the critical habitat of any T/E species;
- Section 106 consultation under the National Historic Preservation Act (NHPA) of 1966 (16 USC §470). Section 106 of the NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings.
- Consistency determination under the Coastal Zone Management Act (CZMA) (16 USC §1451 to 1465). The purpose of the CZMA is to encourage states to manage and conserve coastal areas as unique, irreplaceable resources. The CZMA states that land subject solely to the discretion of the Federal government, such as Federally owned or leased property, is excluded from the CNMI coastal zone. However, Federal activities that directly affect the coastal zone are to be conducted in a manner consistent with the CNMI CZM program. The Navy conducted an effects test to determine whether the action would affect any coastal use or resource in the coastal zone (Chapter 4.0).

The Navy requires that each project identified in the INRMP for FDM and Tinian MLAs comply with all applicable Federal and CNMI regulations. COMNAVMARIANAS would coordinate permits necessary for implementing any natural resources management project on MLAs within the CNMI.

2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Proposed Action, Enhanced Alternative and No Action Alternative. Regardless of which action is implemented, there are pre-existing plans, mitigation measures, land use constraints, and Biological Opinions (BOs) that govern Navy activities at the MLAs to protect the environment. These environmental protections are described in the *Marianas Training Plan for DoD Facilities and Activities* (MTP) of 1998, the associated MTP EIS, the COMNAMARIANAS Instruction 3500.4 Marianas Training Handbook (2000), and COMNAVMARIANAS Instruction 5090.10, *Brown Tree Snake Control and Interdiction Plan* (2000). A copy of the COMNAVMARIANAS *Brown Tree Snake Control and Interdiction Plan* (2000) is included for reference in Appendix A.

2.1 PROPOSED ACTION

The Proposed Action is to adopt the INRMP for the FDM and Tinian MLAs, including the ecosystem management strategies and objectives identified for each MLA, and implementing INRMP Navy Level 1 projects. Navy Level 1 projects are defined as those projects that must be implemented in order to satisfy applicable Federal and local regulatory requirements such as the ESA.

The INRMP identifies specific objectives for each of the seven ecosystems defined for the FDM and Tinian MLAs, as shown on Table 1. The objectives are relevant to one or more of the four management categories (rightmost columns). The “X” indicates which of the management categories are primarily addressed by the objective.

The following natural resources management projects were deemed Navy Level 1 projects and are proposed for implementation between fiscal years 2004 – 2012:

- 61755NR06 INRMP Update for Tinian and FDM MLAs;
- 61755NR12 Endangered Species Mitigation, FDM MLA;
- 61755NR13 Species Surveys (marine surveys), FDM MLA;
- 61755NR118 Megapode Survey, Tinian MLA;
- 61755NR119 Hagoi Moorhen Management Plan, Tinian MLA;
- 61755NR122 Native Forest Enhancement, Tinian MLA;
- 61755NR123 Sea Turtle Monitoring, Tinian MLA;
- 61755NR124 Marine Resource Survey, Tinian MLA;
- 61755NR127 Wetland Delineations, Tinain MLA; and
- 61755NR410 Species Survey (monthly wildlife surveys), FDM and Tinian MLAs.

Project summaries are provided in Appendix B.

Table 1: FDM and Tinian MLA INRMP Management Objectives

Ecosystem	INRMP Management Objectives	Management Category*			
		FM	LM	FW	OR
FDM					
Coastal	1. Protect coastal resources from non-point source pollution		X	X	
	2. Monitor trends in ecosystem health		X	X	
Cliffflines	1. Protect cliffline avifauna populations		X	X	
	2. Monitor trends in topography and avifauna populations		X	X	
Inland Mesic Terrace	1. Protect avifauna populations		X	X	
	2. Monitor trends in avifauna populations and vegetation		X	X	
	3. Enhance vegetative regrowth		X		
	4. Expand avifauna habitat elsewhere within the archipelago		X	X	
Tinian					
Coastal	1. Establish baseline biota data for nearshore waters and intertidal areas		X	X	
	2. Preserve and protect valued coastal resources		X		
	3. Determine trends in marine and terrestrial ecosystem health through long–term biological surveys		X	X	
Wetlands	1. Preserve, protect and enhance wetland resources		X	X	
	2. Monitor trends in avifaunal populations		X	X	
	3. Control and prevent introduction of alien species		X	X	
Cliffline	1. Preserve and protect limestone forests from inappropriate land use		X		
	2. Expand cliffline forests	X	X		
	3. Determine trends in ecosystem health through long-term biological monitoring		X	X	
	4. Continue actions to prevent the accidental introduction of the BTS		X	X	
Lowland	1. Protect resources for sustainable multipurpose use		X		X
	2. Enhance and expand avifauna habitat		X	X	
	3. Prevent introduction of alien species		X	X	
	4. Control the spread of alien species		X	X	
	5. Determine trends in ecosystem health through long-term monitoring		X	X	

*FM = Forest Management; LM = Land Management; FW = Fish and Wildlife Management; OR = Outdoor Recreation Management; *shade* = Category not relevant to MLA or ecosystem; *blank* = not the primary intent of the objective; X = primary intent of the objective

2.2 ENHANCED ALTERNATIVE

The Enhanced Alternative would adopt the INRMP for MLAs on FDM and Tinian, including the ecosystem-based management strategies and objectives identified for each island as described in the Proposed Action, and implement INRMP Navy Level 1 projects (introduced in Chapter 2.1) and Navy Level 2 projects. Navy Level 2 projects are defined as those projects that are implemented to satisfy DoD and Navy policy decisions and initiatives; however, are not required or mandated by Federal law or regulations.

In addition to the Navy Level 1 projects identified above for the Proposed Action, the following Navy Level 2 natural resources management projects are proposed for the Enhanced Alternative:

- 61755NR31 Enhance Native Forest, Tinian MLA;
- 61755NR101 Conservation Mapping, Tinian and FDM MLAs;
- 61755NR117 Avian Survey, Tinian and FDM MLAs;
- 61755NR120 Outdoor Recreation Planning, Tinian MLA;
- 61755NR121 Ecosystem Health Indicator Study; Tinian MLA;
- 61755NR125 Vegetation Survey, Tinian MLA; and
- 61755NR126 Long-term Resource Monitoring, Tinian MLA.

Project summaries are provided in Appendix B.

2.3 NO ACTION ALTERNATIVE

The No Action Alternative would preserve the status quo. The existing NRMP for the Tinian MLA would not be updated. The Tinian NRMP is based on multiple-use management strategies vice ecosystem-based strategies. It identifies five management measures rather than management objectives. The measures are as follows:

- Maintain existing natural resources protection measures that include maintain “off-limits”, “no-ground”, and “no wildlife disturbance” areas, and to continue beach surveys;
- Control the introduction and spread of exotic species, primarily continue brown tree snake control and interdiction efforts on Tinian and assessing the impact of rats on the moorhen population;
- Implement additional natural resources management measures such as monitoring Hagoi, protecting wetlands, and public awareness of sensitive wildlife habitat;
- Conduct species/habitat research including sea turtle, megapode, moorhen, Tinian monarch studies, and reforestation of native forest vegetation; and
- Develop natural resources education programs.

Many of these measures have been completed.

Without an INRMP, the Navy would be in non-compliance with the SAIA and would implement only actions and INRMP projects currently designated as Navy Level 1 projects. These include projects recommended in existing ESA BOs that were generated during the MTP EIS development and the current approved BTS Interdiction and Control Plan (Appendix A of this EA). The following natural resources management projects are currently programmed for execution:

- 61755NR12 Endangered Species Mitigation, FDM MLA;
- 61755NR13 Species Surveys (marine surveys), FDM MLA; and
- 61755NR410 Species Surveys (monthly wildlife surveys), FDM and Tinian MLAs.

Project summaries are provided in Appendix B.

The No Action Alternative would not achieve the purpose and need for the project, but was carried through the analysis as a benchmark to compare the magnitude of environmental effects of the alternatives, including the Proposed Action.

2.4 COMPARISON OF THE PROPOSED ACTION AND ALTERNATIVES

The objectives of the Proposed Action and alternatives are geographically presented on Figures 2 and 3 for comparison purposes. The figures present the Proposed Action and alternatives' boundaries of the four management areas for FDM and Tinian MLA, respectively. Two of the management areas (Forest Management and Outdoor Recreation Management) are not relevant to the FDM MLA because of military land use and natural resource constraints.

Many of the differences among the Proposed Action and alternatives are not readily apparent on the figures because some of the objectives and specific projects proposed to meet these objectives affect the entire MLA. The figures are annotated to highlight the differences that are not graphically apparent.

The Proposed Action and alternatives would each provide beneficial impacts to the environment. No adverse environmental impacts would result from any of the alternatives. The level of benefit varies among the alternatives, and only the Enhanced Alternative would provide beneficial impact to the Forest Management and Outdoor Recreation Management Areas.

LEGEND

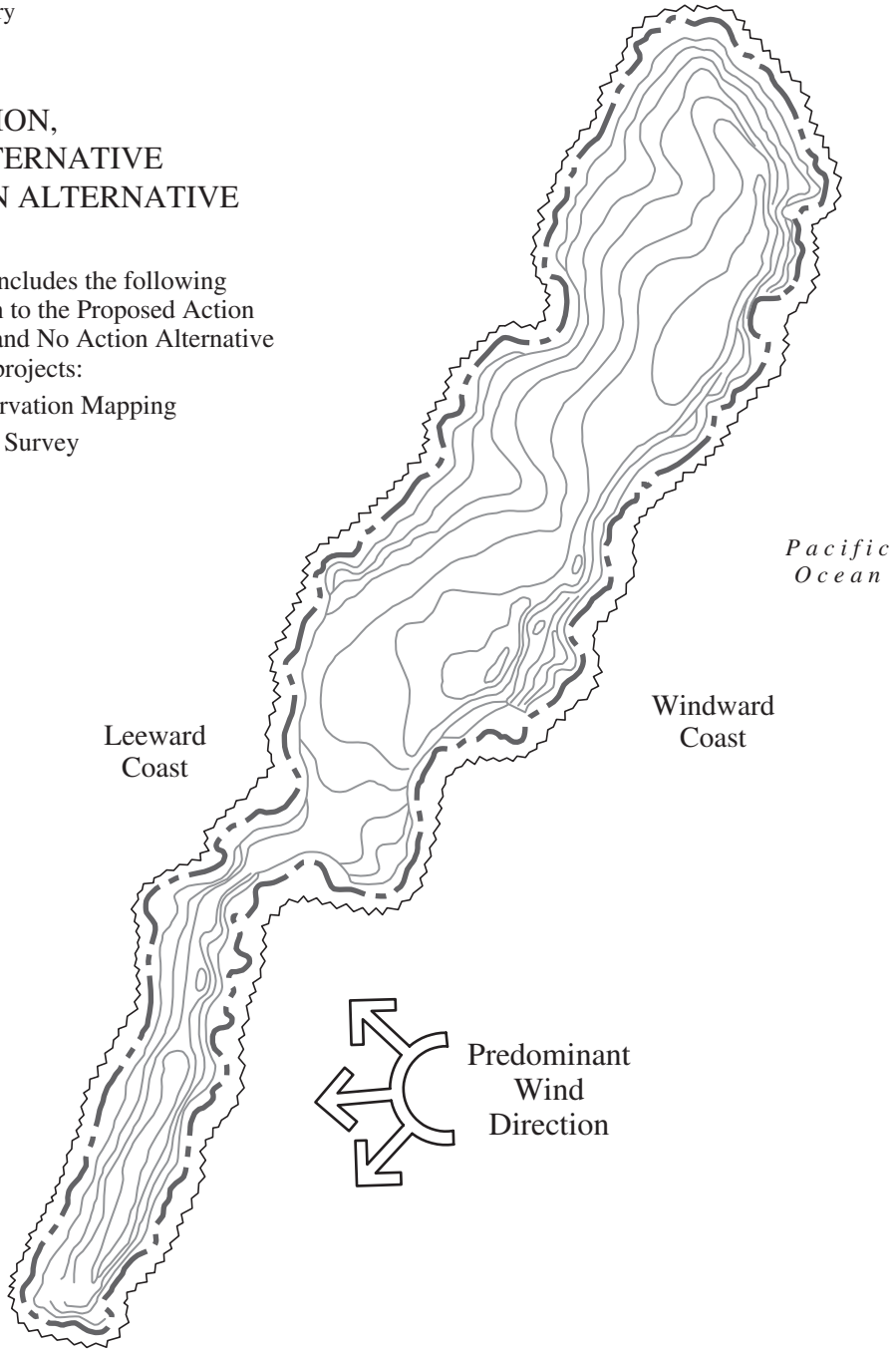
Land Management Boundary (MLA-wide)

Fish & Wildlife Management Boundary

PROPOSED ACTION, ENHANCED ALTERNATIVE AND NO ACTION ALTERNATIVE

Enhanced Alternative includes the following two projects in addition to the Proposed Action (listed in Chapter 2.1) and No Action Alternative (listed in Chapter 2.3) projects:

- 61755NR101 Conservation Mapping
- 61755NR117 Avian Survey



Notes: 1. There are no Forest Management or Outdoor Recreation Management Areas on FDM.

2. MLA does not include marine waters seaward of intertidal zone.

Source: Marianas Training FEIS, 1999, modified.

FDM MLA Natural Resource Management Area Alternatives

Environmental Assessment FDM and Tinian MLAs INRMP

0 Feet 1200

0 Meters 300

Figure 2

LEGEND

- Land Management Area Boundary (MLA-wide)
- Fish & Wildlife Management Area
- Forest Management Area
- Outdoor Recreation Management Area
- **MLA** Military Lease Area (MLA does not include marine waters seaward of intertidal zone.)
- (31) Navy Project 67155NR**31**

PROPOSED ACTION

Allow public access for outdoor recreation, but no outdoor recreation management projects proposed. (Chapter 2.1 lists Proposed Action projects.)

ENHANCED ALTERNATIVE

Includes the following projects in addition to Proposed Action projects:

- Recreational Plan for entire MLA (120).
- Enhance native forest (31).
- Establish long-term monitoring plots (126).
- Map vegetation communities for entire MLA (125).
- Complete GIS (101).
- Design and implement statistically valid avifaunal survey (117).
- Ecosystem Health Indicator, Tinian MLA (121).

NO ACTION ALTERNATIVE

Maintain land use constraints, and public access for outdoor recreation, but no new resource management projects are proposed. Continue monthly wildlife surveys (410). (Chapter 2.3 lists No Action projects.)

Source: FDM and Tinian MLA INRMP, 2003, modified.

Tinian MLA Natural Resources Management Alternatives

Environmental Assessment FDM and Tinian MLAs INRMP

0 Feet 8000
0 Meters 2400

Figure 3

Table 2 summarizes the environmental impacts of the Proposed Action and alternatives on the resource management categories. Table 3 summarizes the potential environmental impacts of the Proposed Action and alternatives on the resource issues. There are no adverse environmental impacts associated with the Proposed Action and alternatives with the key difference being the degree of beneficial impact.

Table 2: Summary of Potential Impacts on Resource Management Categories

Resource Management Category	Proposed Action	Enhanced Alternative	No Action Alternative
Forest Management	+	+	0
Fish and Wildlife Management	+	+	+
Land Management	+	+	0
Outdoor Recreation Management	0	+	0
+ = Beneficial impact; 0 = No impact			

Table 3: Summary of Potential Impacts on Resources

Resource	Proposed Action	Enhanced Alternative	No Action Alternative
SAIA Compliance	Yes	Yes	No
Biology:			
T/E Species	+	+	+
Other Species of Value	+	+	0
Wetlands	+	+	0
Physical (e.g., topography, climate, soils, water resources, infrastructure, air quality, noise, and traffic)	0	0	0
Socio-economic (e.g., population, employment, effects on children, disadvantaged and minority populations)	0	0	0
Land Use	0	+ (Beneficial impact on recreational use)	0
Hazardous/Regulated materials	0	0	0
Solid Waste	0	0	0
Cultural	0	0	0
Construction-related impacts	0	0	0
+ = Beneficial impact; 0 = No impact			

3.0 AFFECTED ENVIRONMENT

This chapter presents the environmental conditions that may be impacted by the natural resources management approach of the Proposed Action and alternatives. Preliminary project screening indicated that the Proposed Action and alternatives could potentially impact biological resources. Biological resources consist of T/E species and those species that while not Federally listed, are valued in a region for other reasons such as being unique to a particular area or having cultural significance. The existing Tinian MLA and FDM MLA biological resources are described in this chapter and carried through the impact analysis of Chapter 4.0. The following resources would neither affect nor be affected by the Proposed Action and alternatives, but they are briefly described and dismissed early in this chapter:

Physical (e.g., topography, climate, soils, water resources, infrastructure, air quality, and noise). The topography of the two MLAs includes cliffline, coastal and relatively flat inland areas. The soils types vary across the changing topography.

There is minimal infrastructure located within the Tinian MLA, and no infrastructure on FDM. The VoA relay station located within the Tinian MLA has utility services such as electricity and wastewater. There are no other Federal utilities or operational facilities within the Tinian MLA, except for a Navy constructed septic tank and leaching field. Other infrastructure includes roadways and airfields, most of which were constructed for historical military use. Except during military training exercises, the roadway traffic within the MLA on Tinian is unrestricted.

Surface water does not exist on FDM, and there are no groundwater wells. There are clay-lined areas (wetlands) on Tinian that impound rainwater. The groundwater for the island population is withdrawn from Makpo wells that are located outside and south of the MLA.

None of the alternatives would impact these physical resources. No significant impacts to topography, climate, soils, water resources, infrastructure, air quality, or noise are anticipated.

Socio-economic (e.g., population, employment, effects on children, disadvantaged and minority populations). There are no socio-economic resources on FDM. There are recreational and agricultural land uses within the Tinian MLA. Except for the VoA facility and the agricultural lots, there are no places of employment within the Tinian MLA. The schools and villages are located outside of the MLA. None of the alternatives would impact overall population or employment levels on Tinian. There are no known significant or adverse environmental impacts that would disproportionately affect minority or low-income communities and no increase to health and safety risks that disproportionately affect children (see discussion of Executive Orders (EOs) 12898 and 13045 in Chapter 4.0).

Land Use. Military land use and constraints are thoroughly described in the MTP and MTP EIS. Military land use is the only type of land use permitted in the FDM MLA. Military training on Tinian constrains public use of portions of the MLA during periodic exercises. No Navy personnel are permanently located in the Tinian MLA. In addition, there are agricultural, recreational, and communications land uses within the Tinian MLA. The Proposed Action and the No Action Alternative would have no impact on the existing land uses of the MLAs. The Enhanced Alternative would have an additional beneficial impact on recreational resources through the proposed development of an outdoor recreation plan (Navy Project: 67155NR120).

Hazardous/Regulated materials. FDM and coastal areas are impacted by past and current live fire training activities resulting in unexploded ordnance (UXO). There is a firing range within the Tinian MLA that is no longer used, but is also impacted by UXO. The presence of UXO is a land use constraint and access to those areas is restricted to authorized DoD personnel. The Proposed Action and alternatives would not impact the presence of hazardous or regulated wastes.

Traffic. There is no traffic on FDM unless authorized by a DoD agency. The Proposed Action and alternatives would not increase the traffic on FDM. The multipurpose use of the Tinian MLA results in minor traffic from recreational and agricultural uses and the VoA employees. The natural resources management objectives of the Proposed Action and alternatives would not generate traffic. Implementation of the Proposed Action or Enhanced Alternative may result in a slight increase in the number of trips to the MLA, but the increase would be insignificant and temporary.

Solid Waste. There are no solid waste disposal sites within either of the MLAs. Minimal amounts of solid waste that may be generated during implementation of the Proposed Action or alternatives would be properly disposed outside of the MLA.

Cultural. There are few cultural and historical resource inventories of FDM because of the UXO hazards. An archaeological survey was conducted in 1997, which stated that it was highly improbable that a permanent human population ever resided on FDM due to the lack of water, the exposed environment, or difficult beach landing. No evidence of pre-historic or historic human activity was identified during the brief archaeological survey. There are numerous archaeological and cultural resources on Tinian, which have been well documented. There is a self-guided tour of historic features, many of which are located within the MLA. The Proposed Action or alternatives would have no effect on any previously recorded historic properties.

Construction-phase related impacts. No permanent construction activities are anticipated with the implementation of the alternatives; therefore, no construction-phase impacts are anticipated under the Proposed Action or alternatives.

3.1 FDM MLA BIOLOGICAL RESOURCES

FDM MLA is characterized by three ecosystems: coastal (intertidal and subtidal areas), clifflines and interior mesic terraces. These designations were briefly introduced in Table 1 and further described in Table 4. Per the lease agreement with the CNMI, the FDM MLA does not include the deeper marine waters located seaward of the coastal ecosystem. The discussion of marine biotic community is limited to those marine resources whose life cycles are dependent on the coastal ecosystem. For example, sea turtles are dependent on intertidal areas for foraging on algae and seagrasses, and nesting, while the life cycles of other marine species that are observed in the vicinity of FDM (e.g., humpback and other whales, and dolphins) are not directly dependent on coastal ecosystems and are not discussed.

Table 4: FDM MLA Ecosystem Characteristics

Ecosystem	Geography	Topography	Biotic	Current Health
Coastal	Marine intertidal area surrounding FDM	Two small beaches, generally deep drop-offs	Algae, coral, sea turtles, fish, invertebrates	Good, some physical evidence of training
Clifflines	Cliffs on perimeter of FDM (extending inland 10 m at plateau)	Steep limestone rock outcropping	Minimal vegetation, migratory bird nesting in north peninsula	Disturbed by historical land use; bird habitat, some physical evidence of training

3.1.1 T/E Species

There are no T/E plant species on FDM.

Green sea turtles (Federally listed as threatened) and occasionally hawksbill sea turtles (Federally listed as endangered) are observed in coastal waters. They are unlikely to land or nest at the two FDM beaches as they are unfavorable for sea turtle nesting. Based on monthly “index” surveys between 1997 and 2002, the numbers of foraging sea turtles appear to be increasing in the vicinity of FDM.

The only endangered species identified on FDM is the Micronesian megapode (*Megapodius laperouse*). It is endemic in CNMI and was Federally listed as endangered in 1970. No critical habitat has been designated for the species. FDM may be a rest stop for megapodes traveling between islands; although it is unlikely to support a large megapode population. In 1997, the USFWS estimated the population at 10 birds on-island, representing less than 1 percent of the entire Marianas archipelago population. The USFWS issued a BO (Appendix D) allowing the take of the megapodes through military training.

3.1.2 Other Species of Value

Two plant species, *Digitaria gaudichaudii* and *Gossypium hirsutum* var. *taitense*, considered rare in the Marianas, have been observed on FDM.

Several species of seabirds that are protected by the Migratory Bird Treaty Act (MBTA), including black noddies, brown noddies, and white terns utilize FDM sea caves for nesting and roosting. The red-footed booby is the most common species observed. Both the masked booby and brown booby are ground nesters, while the red-footed booby is a tree-nester. A small colony of great frigatebirds (*Fregata minor*) has been observed nesting on the western (leeward) side of the island where the vegetation can support their nests.

A Navy biologist observed one Mariana fruit bat on FDM in 1996, but no other sightings have been recorded. The USFWS has proposed listing the Mariana fruit bat as a threatened species in the Marianas. Currently, the species is Federally listed as endangered on Guam and locally listed as endangered in CNMI. The lack of a dependable fresh water source and suitable habitat probably limits the FDM population of Mariana fruit bats to individuals migrating between islands.

3.2 TINIAN MLA BIOLOGICAL RESOURCES

Four ecosystems are defined in the INRMP for the Tinian MLA: coastal (intertidal areas and inland including coastal forests and strand vegetation), lowland lands, clifflines, and wetlands. The ecosystems were introduced in Table 1 and a summary of Tinian ecosystem characteristics is presented in Table 5. Per the lease agreement with the CNMI, the Tinian MLA does not include the deeper marine waters located seaward of the coastal ecosystem. The discussion of the marine biotic community is limited to those marine resources whose life cycles are dependent on the intertidal waters. For example, sea turtles are dependent on intertidal areas for foraging on seagrasses and nesting, while the life cycles of other marine animals that are observed in the vicinity of Tinian (e.g., humpback and other whales, and dolphins) are not directly dependent on coastal ecosystems and are not discussed.

Table 5: Tinian Island Ecosystem Characteristics

Ecosystem	Geography	Topography	Biotic	Current Health
Coastal	Marine intertidal area surrounding Tinian	Numerous beaches, reefs	Algae, coral, sea turtles, fish, invertebrates, seagrasses, strand and coastal forest	Good
Lowland	Predominant island coverage	Relatively flat	Tangantangan, land crabs, forest birds, sea and shore birds, crops, grazing	Mixed use, disturbed by historical land use, yet secondary forest is valued bird habitat
Clifflines	Isolated	Steep	Primary growth limestone forests, sea and shore birds, and forest birds	Good, yet historical dramatic reduction of acreage
Wetlands	Small isolated inland areas	Ponding rainwater, relatively flat	Mariana moorhen, migratory birds, wetland vegetation	Good

3.2.1 T/E Species

There are no Federally listed T/E plants on Tinian.

There are five bird species and two sea turtles that are Federally listed. No Federal critical habitats have been designated on Tinian. Green sea turtles (Federally listed as threatened) and occasionally hawksbill sea turtles (Federally listed as endangered) are observed in coastal waters. Tinian has been identified as a primary resident green turtle habitat with a predominance of juveniles (Kolinski, 2001). It is illegal to take sea turtles, including sea turtle eggs.

Two of the five protected bird species have not been observed on Tinian in recent history. The endangered Mariana mallard (*Anas oustaleti*), recently officially declared extinct, and the endangered Mariana swiftlet (*Aerodramus bartschi*), presumed extirpated, were last observed in 1974 and 1976, respectively. After a review of all available scientific information, the USFWS concluded that the Mariana mallard is extinct and published a final rule in the Federal Register on February 23, 2004, removing the species from the Federal list of T/E species. The three other protected bird species are: the Mariana common moorhen, the Micronesian megapode and the Tinian monarch.

The Mariana common moorhen (*Gallinula chloropus guami*) is wetland-dependent. An estimated 18 percent of the Marianas-wide Mariana common moorhen population is at

Hagoi. The USFWS recovery plan for the endangered moorhen proposes a goal of 75 individuals, and the current population is approximately 40 to 50 (U.S. Geological Survey, 2003). The moorhen populations declined due to habitat loss (vegetation encroachment), historical poaching, and predation by rats and monitor lizards.

The Micronesian megapode (*Megapodius laperouse*) was reportedly common on Tinian in 1902; however, none were observed in a 1970 survey. Its primary range is within the upland cliffline forest, an area least disturbed by storms and anthropogenic forces. It was listed as endangered in 1976 and individuals were again reported on Tinian in 1985. The numbers detected in recent surveys (Witteman, 2001) are too small to statistically estimate a population size on Tinian. It is unknown whether the birds are migrant, introduced, or a resident population. One hypothesis is that the megapode transits between breeding populations on different islands.

The Tinian monarch (*Monarcha takatsukasae)* is endemic to Tinian and is Federally listed as threatened. In 1999, USFWS proposed delisting of the species (Federal Register Vol. 64, No. 34). The Tinian monarch population is estimated at 57,000 throughout the island and favors cliffline limestone forests. It also forages and breeds in tangantangan (*Leucaena leucocephala)* (Lusk et al., 2000).

3.2.2 Other Species of Value

Vegetation

There are habitats in the Tinian MLA that are valued for the high numbers of T/E faunal species they support, and certain plant species are valued for their uniqueness on Tinian. These habitats include the cliffline limestone forests, tangantangan secondary forests, Hagoi wetland, and unique coastal vegetation.

Cliffline limestone forests are centrally located within the MLA. Umumu (*Pisonia grandis*) is common in these forests. A second type of vegetation is more common in areas of the typhoon forest that have not sustained typhoon damage and includes gulos (C*ynometra)*, nunu (*Ficus)*, and pai-pai (*Guamia*). These species flower often and grow well in shade. The dwindling limestone forest is valued for supporting populations of the endangered Micronesian megapode and the Mariana fruit bat. As noted, the Tinian monarch appears to thrive in the limestone forests as well.

Secondary growth forests contain a mixture of introduced trees, shrubs and dense understory plants. Dominant trees include tangantangan (*Leucaena leucocephala*), Formosan koa (*Acacia confusa*), kamachile (*Pithecellobium dulce*) and ironwood (*Causarina equisetifolia*). Tangantangan forests dominate most of the level to moderately sloping areas and serve as secondary habitat for protected and valued bird and bat species. The Tinian MLA is dominated by this species.

Hagoi, within the MLA, is the largest wetland on Tinian and supports the endangered Mariana common moorhen. Amidst the fringing forested swamp is approximately 2.47

ac (1 ha) of open water (averaging 3 feet (1 meter (m)) in depth) during the wet season. During the dry season, the water levels at the established depth gauges within Hagoi are insufficient to measure and the open water area is reduced to puddles of water. Historically, there was farming adjacent to Hagoi, yet the interior was not disturbed. It is considered the least disturbed wetland of the Marianas archipelago. Hagoi is classified under the Cowardin System as follows:

- System: palustrine;
- Class: emergent wetland;
- Subclass: persistent;
- Water Regime: intermittently exposed;
- Water Chemistry: mixohaline; and
- Dominant plants: herbaceous emergents.

There are no unique species at Hagoi. The vegetation structure is relatively undisturbed. The mixed vegetation around the open water area is dominated by bulrush (*Scirpus litoralis)*, with patches of leather fern (*Acrostichum aureum)*, and rice-grass (*Paspalum orbiculare*). This band of mixed vegetation is surrounded by a band of native karisso (*Phragmites karka*), an obligate wetland species. Crop plants have been planted in areas and these disturbed areas have ironwood trees, vines and weedy herbs.

Euphorbia sparrmannii var. *tinianensis* is a semi-succulent herb, which is endemic to Tinian and occurs only at Unai Masalok. Lamanibot Bay and headlands are valued as a healthy xerophytic-halophytic scrub community with ufa (*Heritiera longipetiolata*), locally called halomtano (NAVFAC PACIFIC, 1985).

The blowhole at Unai Chiget is unique because the salt spray impacts areas high along the cliff slope creating rim terrace pools. Polynesian heliotrope (*Heliotropium anomalum)* is present in the area and has not been reported elsewhere on Tinian.

Sea turtles feed on seagrass beds within the MLA at Puntan Lamanibot Sanhilo and Unai Chiget (NAVFAC EFD PACIFIC, 1997). Valued seagrass beds are also located at Unai Masalok. Chaguan-tasi (*Enhalus acoroides*) is a large sea grass thriving on Tinian only at Unai Chiget. It is common on Guam and other Pacific reefs and is not considered threatened, endangered or rare. The Chiget area includes a forest of nonag (*Hernandia sonora*), a strand species, against the cliff behind the beach. Dense areas of nonag are rare anywhere and this one is unique on Tinian.

Fauna

Twenty-one species of seabirds and shorebirds sighted in Tinian are protected by the MBTA. Shorebirds are the largest group of migratory birds to pass through Tinian, and they tend to favor the fresh water areas of wetlands. There are no large concentrations of seabirds observed on Tinian. Small populations of brown noddies were observed roosting and nesting near Unai Chiget and Unai Masalok. Seabirds on Tinian tend to be

observed off-shore in larger numbers near the commercial harbor at San Jose, outside of the MLA.

It is illegal to take fruit doves, ground doves, fruit bats, and megapodes. The (*Birgus latro*) coconut crab is the largest land-dwelling crustacean and is a subsistence food item. They are nocturnal and the areas inhabited by adults are inland within dense forests. Fish and shellfish harvesting is regulated by CNMI hunting regulations.

No permanent Mariana fruit bat colony is believed to exist on Tinian. The bat roosts in trees of the cliffline and wetland ecosystems, particularly in the vicinity of Hagoi, and clifflines near Mt. Lasso within the MLA. Although hunting restrictions and education on Tinian have increased public awareness, the Mariana fruit bat continues to be considered a delicacy. The current population continues to be small and there appears to be sufficient food resources to sustain a much larger population.

4.0 ENVIRONMENTAL CONSEQUENCES

This chapter provides the probable direct, indirect and cumulative impacts on biological resources generated by the Proposed Action and two alternatives: the Enhanced Alternative and No Action Alternative.

Factors considered in determining whether an alternative could have a significant impact on biological resources include the extent or degree to which the management objectives or implementation of an alternative would: 1) adversely impact T/E species; 2) affect sensitive habitat or habitat critical to the existence of any T/E species; or 3) negatively change the distribution or reduce the population of other species of value.

4.1 FDM MLA BIOLOGICAL RESOURCES

Implementation of the Proposed Action or alternatives would not adversely impact T/E species and other biological resources of value within the FDM MLA. All projects proposed are monitoring, survey or conservation mapping projects, except Project 67155NR12 (described below). The terrestrial mapping (Enhanced Alternative only) and surveys are conducted aerially and the marine surveys proposed do not involve physical disturbance of submerged lands or marine life.

Project 67155NR12 would be included in the Proposed Action, Enhanced Alternative, and No Action Alternative. The project consists of ongoing mitigation recommended in the USFWS MTP BO to address the permitted Micronesian megapode take. It provides habitat protection and enhancement for the Micronesian megapode outside of the FDM MLA, but within CNMI. Historically, the project has included eradication of feral ungulates that destroy Micronesian megapode habitats on the islands of Sarigan and Anatahan (Figure 1). The specific projects generally require two to three years to complete and the USFWS would be consulted to identify new projects. Project-specific NEPA review may be required. Historically, the projects have met the criteria for a categorical exclusion and no significant adverse impacts on T/E or valued biological resources were identified.

The more projects completed under the Proposed Action or alternatives, the greater the beneficial impact on FDM MLA's biological resources. The Enhanced Alternative would include two projects in addition to those under the Proposed Action, and would have more beneficial impact on FDM's biological resources than either the Proposed Action or No Action Alternative. On completion of the Proposed Action, the additional projects described under the Enhanced Alternative will be considered for implementation subject to the availability of funding.

No cumulative adverse impacts are anticipated. None of the alternatives would: 1) adversely impact T/E species; 2) affect sensitive habitat or habitat critical to the existence of any T/E species; or 3) negatively change the distribution or reduce the population of other species of value.

4.2 TINIAN MLA BIOLOGICAL RESOURCES

Implementation of the Proposed Action or alternatives would not adversely impact T/E species and other biological resources of value within the Tinian MLA. Many of the projects proposed are ongoing and no new biological impacts are anticipated. Mapping studies and management plan preparation would not involve field work, except for reconnaissance activities and field verification of data; therefore, no adverse biological impacts are anticipated. Implementation of the long-term management plan for Hagoi may require NEPA documentation; however, the current INRMP project (67155NR119) is limited to plan development.

Of the monitoring and survey projects proposed, only the Sea Turtle Monitoring Study, Tinian MLA (Project 67155NR123) involves handling T/E species. Per ESA, any handling of T/E species has potential for adverse impacts on the sea turtles and ESA Section 7 consultation with NMFS and USFWS will occur prior to tagging animals. Project 67155NR123 is included in the Proposed Action and the Enhanced Alternative. The Navy's role in these projects would be limited to providing satellite time and monitoring units (tags) to USFWS or CNMI, who would be responsible for obtaining necessary permits, animal tagging, and data compilation.

Navy Projects 67155NR31 (Tinian Reforestation, Tinian MLA) and 122 (Native Forest Enhancement, Tinian) are planting projects that are likely to cause minimal disturbance to existing vegetation. The purpose of the projects would be to plant species of value, and care would be taken to avoid damage to existing vegetative species of value. NEPA review may be required.

The more projects completed under the Proposed Action or alternatives, the greater the beneficial impact on Tinian MLA's biological resources. The Enhanced Alternative would include six projects in addition to those of the Proposed Action, and would have more beneficial impact on Tinian's biological resources than either the Proposed Action or No Action Alternative. On completion of the Proposed Action, the additional projects described under the Enhanced Alternative will be considered for implementation subject to the availability of funding.

No cumulative adverse impacts are anticipated. None of the alternatives would: 1) adversely impact T/E species; 2) affect sensitive habitat or habitat critical to the existence of any T/E species; or 3) negatively change the distribution or reduce the population of other species of value.

4.3 CONSISTENCY WITH APPLICABLE LAWS AND REGULATIONS

This section provides an overview of the various land use policies and procedures that may be applicable prior to implementation of the Proposed Action or Enhanced Alternative.

4.3.1 Section 106, National Historic Preservation Act

This INRMP is a programmatic document intended to identify management objectives for natural resources. Adoption of the INRMP (Proposed Action) would have no effect on historic property. The Navy will continue to screen projects in the implementation phase as they become more precisely defined. The Navy will initiate Section 106 consultation with the CNMI Historic Preservation Office if warranted.

4.3.2 Coastal Zone Management Act

The Navy has conducted an effects test and concluded that the Proposed Action would not have reasonably foreseeable direct and indirect effects on any coastal use or resource of the CNMI coastal zone; therefore, no further documentation is required to be sent to the CNMI Coastal Resources Management Office. Implementation of individual projects may require consultation with the CNMI Coastal Resources Management Office.

4.3.3 Endangered Species Act

The Navy has determined that the Proposed Action and alternatives would not jeopardize the continued existence of T/E species, or result in the destruction or adverse modification of critical habitat of these species. Implementation of specific projects proposed in the Proposed Action or alternatives may require ESA Section 7 consultation with USFWS and NMFS.

4.3.4 Executive Orders

EO 12898, Environmental Justice in Minority Populations and Low-Income Populations

In accordance with EO 12898 dated 11 February 1994, and the Secretary of the Navy Notice 5090 dated 27 May 1994, the Navy is required to identify and address potential for disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations.

FDM is a restricted military training area and is not inhabited by civilians or by military personnel. The population within the Tinian MLA is limited to VoA employees and agricultural leasees. There are no known significant or adverse environmental impacts, including human health, economic or social effects that would disproportionately affect minority or low-income communities resulting from the Proposed Action, Enhanced or No Action alternatives.

EO 13045, Protection of Children from Environmental Health Risks and Safety Risks

In accordance with EO 13045 dated 21 April 1997, Federal agencies are required to make children's health a high priority. To the extent permitted by law and appropriate and consistent with its mission, each Federal agency:

- Shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and
- Shall ensure that its policies, programs, activities and standards address disproportionate risks to children that result from environmental health risks or safety risks.

There are no children on FDM. The Proposed Action or alternatives would not create environmental health and safety risks on Tinian; therefore, there is no health risk that may disproportionately affect children.

EO 13148, Greening the Government Through Leadership in Environmental Management

EO 13148, Part 6, Section 601, dated 21 April 2000, requires Federal agencies to meet goals and requirements in the following areas: environmental management; environmental compliance; right-to-know and pollution prevention; release and use reductions of toxic chemicals and hazardous substances; reductions in ozone-depleting substances; and environmentally beneficial landscaping.

No construction or demolition activities are included in the Proposed Action or alternatives. No regulated materials would be handled, no hazardous waste or pollution would be generated and no landscaping is proposed.

EO 11990, Protection of Wetlands

EO 11990, dated 25 May 1994 requires Federal agencies to:

- Avoid construction or management practices that would adversely affect wetlands;
- Minimize the destruction, loss, or degradation of wetlands; and
- Preserve and enhance the natural beneficial values of wetlands.

The Proposed Action and alternatives would preserve the natural beneficial values of wetlands. No construction is proposed and no destruction or loss of wetlands is anticipated. The Proposed Action and alternatives would continue to monitor the avifauna of Hagoi wetland located within the Tinian MLA. The Proposed Action and Enhanced Alternative would provide the added benefit of a wetland delineation and development of a Hagoi Wetland Management Plan (67155NR119).

EO 13112, Invasive Species

EO 13112, dated 12 January 2001, requires Federal agencies whose actions may affect the status of invasive species to:

- Identify such actions;
- Use relevant programs and authorities to address invasive species; and

- Not authorize, fund or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species, and that all feasible and prudent measures to minimize the risk of harm would be taken in conjunction with the actions.

The Proposed Action and alternative actions would not cause or promote the introduction of invasive species. BTS colonization via air or ship cargo is the greatest concern. There is a BTS Control and Interdiction Plan (Appendix A) that applies to Navy actions. The INRMP projects proposed are primarily planning or surveying projects and no cargo transport would be required. Reforestation projects have historically depended on Tinian resources for labor and equipment. In the event that materials were brought into Tinian they would arrive by commercial aircraft from Saipan. On Tinian, air cargo is subject to inspection and quarantine, per CNMI regulations. The Proposed Action and the Enhanced Alternative would address the eradication of invasive species within Hagoi through development of a management plan (67155NR119).

EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

EO 13186, dated 10 January 2001, requires that a Federal agency taking actions that have, or are likely to have, a measurable impact on migratory bird populations to develop and implement a Memorandum of Understanding (MOU) with USFWS that promotes the conservation of migratory bird populations. Until such an MOU is developed, it is Navy policy to comply with the intent of the EO to protect and conserve migratory birds.

The Proposed Action and alternatives would not have an adverse impact on migratory birds. Any impacts on migratory birds would be beneficial.

4.4 IRRETRIEVABLE AND IRREVERSIBLE RESOURCE COMMITMENTS

Resources that are committed irreversibly or irretrievably are those that cannot be recovered if the proposed project is implemented. The Proposed Action and alternatives would result in irretrievable loss of funds required to pay for skilled labor and materials. There would be no irreversible or irretrievable commitment of land, natural or cultural resources, or conversion of natural undeveloped areas associated with the Proposed Action or Alternatives.

4.5 SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The Proposed Action and alternatives may entail minor land uses associated with small-scale vegetation planting. The long-term benefit would be enhanced bird habitat and increased native vegetation. No other land uses are proposed.

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6.0 REFERENCES

COMNAVMARIANAS, 2000. *Brown Tree Snake Control and Interdiction Plan*. COMNAVMARIANAS Instruction 5090.10.

COMNAVMARIANAS, 2000. *Marianas Training Handbook*. COMNAVMARIANAS Instruction 3500.4. June.

COMNAVMARIANAS, 1998. *Marianas Training Plan for DoD Facilities and Activities.*

Department of the Navy, 2003. The Office of the Chief of Naval Operations Instruction (OPNAVINST) 5090.1B Change-4, Environmental and Natural Resources Program Manual of June 4, 2003.

Department of the Navy, 1998. The Office of the Chief of Naval Operations, letter 5090 over Ser N456/8U589129, *Guidance on Preparing National Environmental Policy Act Documents for Integrated Natural Resources Management Plans*, dated November 30, 1998.

Department of the Navy, 2004. Procedures for Implementing the National Environmental Policy Act. Code of Federal Records, Title 32 Part 775. February 23, 2004.

Kolinski, Steven, 2001. *Sea Turtles and Their Marine Habitats at Tinbian and Aguijan, with Projections on Resident Turtle Demographics in the Southern Arc of the Commonwealth of the Northern Mariana Islands.* National Marine Fisheries Service, NOAA Southwest Fisheries Science Center, Honolulu, Administrative Report H-01-06C.

Lusk, Michael et al., 2000*. Population Status of the Tinian Monarch (Monarcha takatsukasae) on Tinian, Commonwealth of the Northern Mariana Islands*. Micronesica 32(2):181-190.

NAVFAC PACIFIC, 2004. *Farallon de Medinilla and Tinian Military Lease Areas Integrated Natural Resources Management Plan*. Prepared by Helber Hastert & Fee, Planners.

NAVFAC PACIFIC, 1999. *Final Environmental Impact Statement: Military Training in the Marianas*. Prepared by Belt Collins.

NAVFAC PACIFIC, 1997. *Natural Resources Management Plan Military Lease Area, Tinian.* Prepared by Belt Collins.

NAVFAC PACIFIC, 1985. *Final Report for Flora and Fauna Survey of Tinian, Northern Marianas Islands*. Prepared by Hawaiian Agronomics (International) Inc. (US Navy Contract N62742-84-C-0141).

USGS, 2003. *Final Report to the U.S. Department of Navy – Seasonal Movement, Home Range, and Abundance of the Mariana Common Moorehen (Gallinula chloropus guami) on Guam and the Northern Mariana Islands*. Prepared by Leilani L. Takanao and

Susan M. Haig of the USGS Forest Rangeland and Ecosystem Service Center, Corvallis Oregon. April 2003.

Witteman, Gregory J., 2001. *A Quantitative Survey and Inventory of the Micronesian Megapode and Its Habitat on Tinian, CNMI*. Prepared for URS Corporation. April 2001.

APPENDIX A

Brown Tree Snake Control and Interdiction Plan

APPENDIX A
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APPENDIX A:
BROWN TREE SNAKE
CONTROL AND INTERDICTION PLAN

Reference: COMNAVMARIANASINST 5090.10, Brown Tree Snake Control and Interdiction Plan.

I. INTRODUCTION

A. Purpose

Control and interdiction of the brown tree snake (*Boiga irregularis*), hereafter referred to as BTS, is absolutely essential in order to prevent the dispersal of BTS from Guam to other locales via military sea and air shipments of personnel, equipment, and cargo. The Department of Defense (DoD) BTS control and interdiction protocols, practiced on a daily basis by military organizations permanently stationed on Guam, also apply to transient units. The BTS control and interdiction practices are particularly crucial during cargo, equipment, and vehicle shipments from Guam to Tinian in support of military training exercises and during redeployment from Guam to home installations where the BTS has no natural enemies. Adherence to the BTS plan will reduce the ongoing and potential threats of negative impacts on human health and safety, biological resources, and island economies.

B. The Brown Tree Snake Threat

A native species of Indonesia, New Guinea, the Solomon Islands, and Australia, the BTS was inadvertently introduced in Guam sometime between the mid-1940s and the early 1950s. Since its introduction, the population of BTS on Guam has expanded to encompass the entire island's rural and urban areas. The BTS has caused or has been a major factor in the extirpation of most of Guam's native terrestrial vertebrates including fruit bats, and lizards, as well as virtually all of the island's endemic forest and water birds. In addition, the BTS has caused more than one thousand power outages, has preyed on poultry and household pets, and has bitten numerous children.

High densities of snakes occur throughout Guam, including areas where cargo is loaded for transport by air and sea. The potential spread of BTS from Guam via cargo movements is a serious concern since Guam is a trans-Pacific shipping hub and the islands that may receive cargo from Guam have vulnerable environments.[1] BTS sightings have been recorded on the Hawaiian Islands; on Tinian, Rota, and Saipan in the Commonwealth of the Northern Mariana Islands (CNMI); in the Marshall Islands; on Okinawa, Diego Garcia, and Wake Island, as well as in southern parts of the continental United States. With the possible exception of Saipan, there is no documentation supporting any established populations of BTS in any of these locations, although the potential exists for undetected colonization elsewhere due to the difficulty of documenting low-density snake populations that would represent a recent establishment.

[1] USDA et.al.1996. *Environmental Assessment for Brown Tree Snake Control Activities on Guam.*

C. DoD Response to the BTS Threat

A COMNAVMARIANAS BTS Control and Interdiction Plan was first published in 1996. Developed in concert with interested federal, territorial and commonwealth agencies, the plan was based on a spectrum of potential threats of BTS cargo contamination during various training-related shipping situations.

- Examples of low-risk situations included shipping materials and equipment that have been on Guam only during daylight hours while in transit to other destinations, or if on Guam during nighttime hours, shipping materials that were held in containment sites purposely designed as snake-sterile staging areas (SSSA).

- Examples of moderate-risk situations included shipping materials and equipment that have been on Guam during nighttime hours, and potentially exposed to contamination by snakes due to use during training or storage in non-sterile (unprotected) areas. Another moderate risk situation would be when the absence of snakes in the shipment can be readily verified during packing and the visual inspection.

- Examples of high-risk situations included shipping materials and equipment that have been in storage or in regular use on Guam, or objects that are constructed in such a way that it is difficult to verify the absence of snakes without adopting extraordinary inspection measures.

Regardless of the potential degrees of risk, BTS contamination could occur during any training scenario. COMNAVMARIANAS and Commanding Officer, 36th Air Base Wing (ABW), Andersen Air Force Base (AAFB), are responsible for carrying out a viable plan to meet a full spectrum of potential BTS cargo contamination risks at Guam's military ports (see Section III).

- The U.S. Department of Agriculture (DOA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) is the agency that provides primary support to COMNAVMARIANAS and 36th ABW (see Section II for a description of WS functions). WS has established permanent offices on Guam including offices at COMNAVMARIANAS and Andersen AFB.

- Support to the military is also provided by the following federal, territorial, and commonwealth agencies:

- U.S. Department of Interior, U.S. Fish and Wildlife Service (USFWS).

- U.S. Geological Survey, Biological Resources Division (USGS/BRD).

- Guam Department of Agriculture, Division of Aquatic and Wildlife Resources (DAWR).

- CNMI Department of Land and Natural Resources (DLNR).

- State of Hawaii Department of Agriculture (HDOA).

II. USDA APHIS WILDLIFE SERVICES SUPPORT

USDA APHIS field operations on Guam are conducted by the Wildlife Services (WS) staff, consisting of Wildlife Biologists, WS Specialists, and Snake Detector Dog Teams. Logistic support is available to Guam from the WS staff in Yakima, Washington, where equipment and snake traps are made and stored.

WS carries out BTS control and interdiction efforts at all commercial and DoD ports for day-to-day cargo shipments. In support of military exercises, inspection and containment efforts are enhanced and WS will:

1. Conduct a 100 percent canine inspection of all outbound cargo.

2. Identify, purchase, operate, and maintain BTS control tools such as snake handling equipment, snake traps, and snake barriers. Barrier fencing is used to erect a Snake Sterile Storage Area (SSSA) at a port of embarkation on Guam (to keep snakes out of inspected cargo) and a containment area (to keep any snakes in) at the port of debarkation on Tinian. Other tools may be used as needed to accommodate special circumstances and situations.

3. Determine snake-trapping strategies by topographical features and proximity to cargo staging, handling, or processing areas. The BTS trap is a modified minnow trap with a mouse as an attractant within an inner chamber that is inaccessible to snakes. The trap is routinely restocked with food and moisture sources for the mouse. The self-setting traps have one-way entrances on either end and are designed for multiple captures.

4. Assign WS personnel and Snake Detector Dog Teams 24 hours per day, seven days a week during deployment and post-exercise redeployment activities.

5. Use hand-held spotlights during perimeter walks at night to help detect and capture BTS, and use Snake Detector Dog Teams to inspect shipments trucked into the staging area.

To ensure effective communication with exercise participants, WS will rely on a close working relationship with military cargo managers, appropriate installation commanders, and training unit commanders, as well as timely information from military commanders regarding ongoing and future activities.

USDA WS may be contacted through one of three offices on Guam: AAFB Office (telephone 366-3822), Barrigada Heights District Office (telephone 635-4400), or COMNAVMARIANAS Office (telephone 472-7101). Staff at the USDA WS supervisory office in Honolulu can be reached at (808) 861-8576. In addition, cellular phone numbers will be published prior to major exercises to ensure that WS personnel on Guam and Tinian can be reached 24 hours a day.

III. DoD RESPONSIBILITIES

The COMNAVMARIANAS 1996 BTS Control and Interdiction Plan was implemented and evaluated during two major inter-island exercises. The "lessons learned" from these major exercises and the results of other environmental evaluations have been incorporated in the present plan. The plan defines the responsibility for compliance with BTS control and interdiction at each command level and with individuals who involved in military training exercises.

Due to turnover experienced by all military units, the responsibilities relating to BTS threat awareness instruction are frequently repeated to ensure that all persons training in the Mariana Islands are fully knowledgeable of command and individual responsibilities.

A. Guam Installation Commanders

COMNAVMARIANAS and Commander, 36th ABW are responsible for the conduct of BTS control and interdiction on Navy and USAF installations, respectively, and are supported daily by the WS permanent staff assigned to COMNAVMARIANAS and AAFB. The installation commanders are responsible for keeping WS informed of activities that will require their support. Specific command responsibilities are as follows:

1. Fully cooperate with WS to conduct measures necessary to reduce the BTS snake population at port and cargo facilities through an integrated approach consisting of technical assistance and lethal and non-lethal control methods such as prey base reduction, exclusion, habitat modification, and capture.

2. Plan, direct, and coordinate all cargo handling procedures for cargo departing Guam with consideration for the on-going threat of the pan-Pacific spread of BTS.

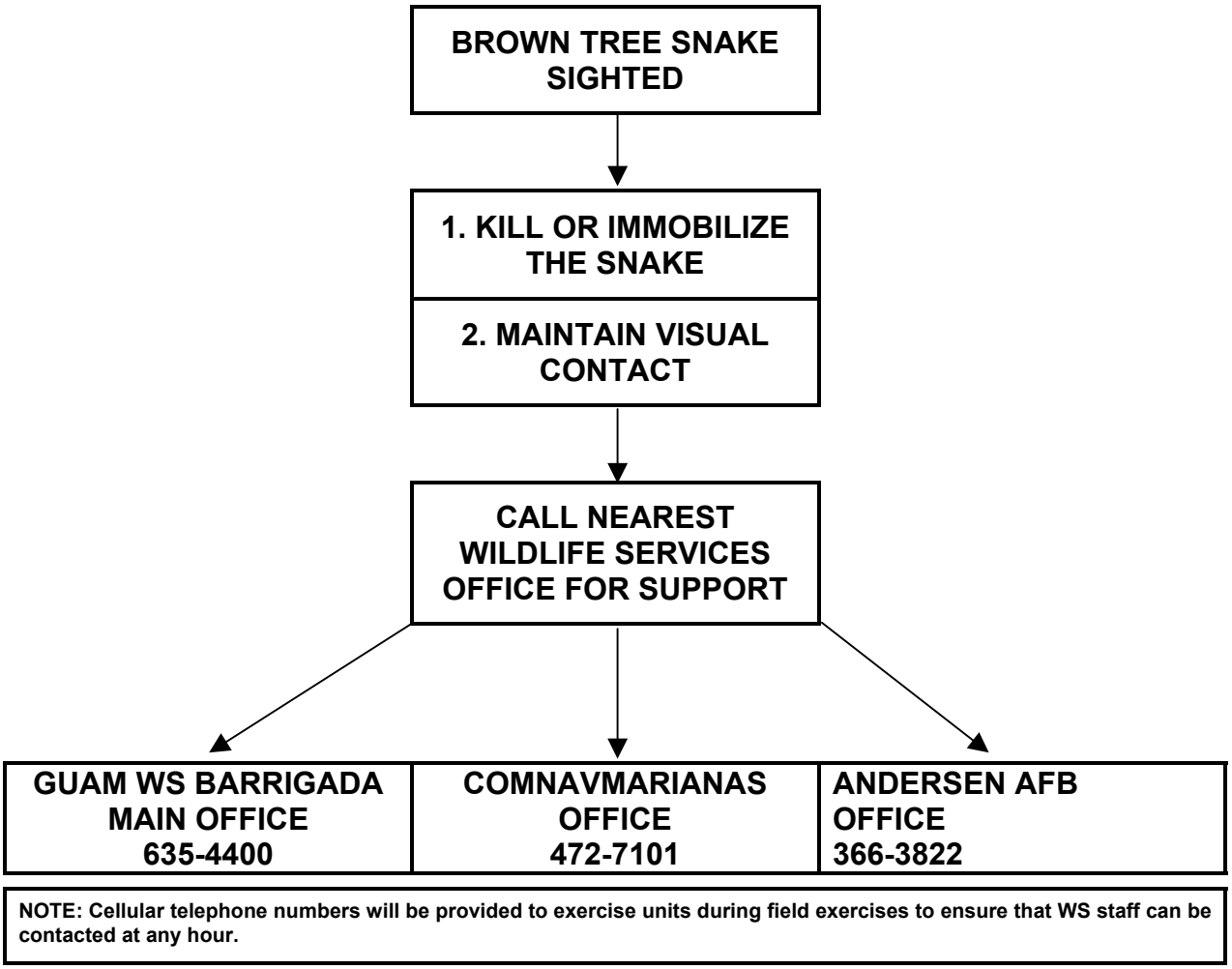
3. Consult with WS to determine the necessity to establish snake sterile cargo staging areas (SSSA).[2]

4. Direct cargo handlers and/or managers to work closely with WS personnel to establish and maintain an effective cargo and equipment BTS inspection process.

5. Publish and distribute the *BTS Emergency Response Protocol*. Prominently display contact information and telephone numbers to report BTS sightings (see Table A-1).

[2] A snake-sterile staging area (SSSA) is a site that is secured by a temporary or permanent snake barrier as defined by USGS construction and materials standards.

TABLE A-1
BTS EMERGENCY RESPONSE PROCEDURES



NOTE: Cellular telephone numbers will be provided to exercise units during field exercises to ensure that WS staff can be contacted at any hour.

6. Conduct information briefings for both permanently assigned and transient personnel. Explain the potential for impacts if BTS were transported from Guam in military vehicles, cargo, and/or equipment. Explain individual responsibilities (kill/capture/immediately report to WS) if and when a BTS is sighted. Use the BTS Awareness instructional videotapes and printed materials, requesting WS participation and/or demonstrations at the briefings when their workloads permit. Provide information cards to personnel as a reminder of the BTS threat and responsibilities for immediate action.

7. Clearly display BTS identification and information posters in tent cities, barracks, and work sites.

8. For major exercises, include BTS control and interdiction procedures in the exercise plan's Environmental Awareness Annex. Include in the annex a copy of the information cards to be distributed to training personnel that will define applicable environmental protective measures, including the BTS protocol.

9. In consultation with WS, direct the sites to be used for tent cities and staging areas for vehicle, cargo pallets and containers, and other equipment.

10. Provide vehicle washing areas and high-pressure wash equipment when needed.

11. Designate areas to be used for inspecting vehicles after they have been cleaned and prior to movement to an SSSA or immediate loading aboard aircraft and/or ships.

12. Provide area lighting at designated inspection and staging.

13. Assist WS as necessary to facilitate timely completion of the mandatory inspection process. (A 100 percent inspection by Snake Detector Dog Teams is conducted for cargo destined for target locations.)

14. Provide personnel and logistic support to augment BTS protocol activities as needed.

15. For major exercises, assign members of the base environmental staff with experience in conducting BTS protocol as members of the Combined Exercise Command Group (CECG) and the Combined Exercise Support Group (CESG).

16. For major exercises and in coordination with WS, enhance rodent control measures, and grounds maintenance practices that reduce the potential for BTS presence in areas selected for vehicle and cargo staging.

17. During day-to-day cargo inspections, the installation commander may authorize WS to stop any cargo carrier from departing Guam with any cargo or equipment suspected to harbor BTS.

B. Major Exercise Commanders

The CECG and CESG conducting major exercises are tasked with a variety of responsibilities to support the exercise force. Logistics coordination in response to command direction is the responsibility of the CESG. Early coordination with WS is required to incorporate BTS control and interdiction requirements into the exercise logistic support plans.[3] For BTS control and interdiction, the CECG/CESG will:

1. Work with the Installation Commander and WS when necessary to establish an SSSA for personal and unit equipment, and vehicle staging.

2. Work with the AAFB commander and WS to develop a parking plan for aircraft that will minimize potential exposure of aircraft to BTS.

3. Supervise the BTS control and interdiction process by providing environmental monitors as needed.

[3] WS representatives are invited to attend the initial, middle, and final planning conferences held when developing major combined and joint exercises in the Mariana Islands and participate as members of the Logistics Working Group.

4. Schedule and monitor BTS interdiction and control briefings for all training units upon arrival.

5. Identify to WS the logistics staff personnel who will be responsible for cargo handling operations and response if BTS are suspected in palletized cargo or containers.

6. Provide to WS the authority to stop any cargo carrier from departing Guam with any cargo or equipment suspected to harbor BTS.

C. Training Unit Commanders

Regardless of the size of training exercises, commanders of resident and transient organizations will request support from the Installation Commander (and/or the CECG and CESG) when tasked with establishing tent cities, staging areas, and areas for inspecting personnel, vehicles and cargo prior to shipment from Guam. The commanders of training units will:

1. Ensure that the installation's staff or CESG conduct BTS control and interdiction information briefings for exercise personnel.

2. Distribute BTS information packets that include the Emergency Response Protocols in case of actual or suspected snake sightings.

3. Coordinate with the on-site commanders to obtain washdown facilities and inspection areas. 36th ABW may provide portable high-pressure washers and a cleaning area. (Future plans include repair of a 36th Transportation Squadron vehicle washing area.)

4. Identify key personnel responsible for cargo staging, handling and inspection to the installation commander/CESG and ensure their cooperation with WS personnel.

5. Provide additional information to cargo handlers to increase their levels of BTS awareness. Cargo handlers comprise the first line of defense against BTS presence in military cargo. Request assistance from WS to review the following:

    a. The history of BTS on Guam, the threat to the environment, action taken to control and interdict BTS, and the goals of existing programs. (Use the USDA video).

    b. A description of implementation efforts on base.

    c. A demonstration by the WS and their Snake Detector Dog Teams.

    d. A live BTS specimen to enhance immediate recognition.

    e. A review of proper methods to kill or capture the snake.

    f. Information cards.

6. Supervise the equipment and vehicle cleaning and inspection prior to moving items to the staging area for WS inspections.

7. Provide to WS complete access to staged cargo and equipment, opening any containers as requested for a WS internal inspection.

8. Designate personnel as inspectors to assist WS during vehicle, cargo and equipment cleaning and inspection.

9. Ensure that WS has completed the inspection process for all sea and air military cargo departing Guam.

10. Prior to departure for off-island destinations, ensure that personal belongings, tents, and canvas used/staged in bivouac areas have been inspected for BTS presence. Request WS assistance prior to breaking camp. Ensure that all personnel conduct inspections of their individual equipment, including hand-carried sea bags and backpacks.

D. Flight Crews

Supporting aircraft may be staged at the AAFB parking apron. When idle, the doors of the aircraft should be closed so that BTS cannot enter the aircraft interior. During pre-flight inspections, flight crews should be alert for potential BTS on aircraft. Request WS assistance as needed.

IV. CONTROL, CLEANING, AND INSPECTION PROCEDURES

The possibility of the inadvertent exportation of the BTS to other areas of the world is always present whenever military units embark from Guam. BTS is a nocturnal snake that will seek shelter during the day in any area that offers shade, including CONEX boxes, MILVANS, commercial shipping containers, crates, pallets, and personal gear, as well as aboard aircraft, ships, and wheeled or tracked vehicles. The BTS can hide in extremely confined spaces, has the ability to go without food for extended periods, and can survive long voyages or flights undetected. Military and commercial air and seaports have recorded several instances of a live BTS arriving from Guam. Therefore, BTS control and interdiction responsibilities have a high priority.

A. BTS Control Measures at COMNAVMARIANAS and AAFB Cargo Points

WS personnel will provide support to the military on a routine basis as well as throughout a training exercise that involves the shipment of military personnel and associated cargo off island via ship (Apra Harbor) and/or aircraft (AAFB). This support is identified in Section II.D above. Ensuring that the BTS protocol is accomplished and that there are no delays in off-island shipments will require full cooperation from the units being inspected prior to embarkation.

Permanent Staging Areas. Permanent staging areas provided by COMNAVMARIANAS and 36th ABW for sea and air cargo are surrounded by chain-link fencing with lighting. The areas are extensively patrolled for BTS but are *not* snake-sterile area. COMNAVMARIANAS uses Sierra Wharf and warehouse facilities at the former Fleet Industrial Supply Center (FISC). At

AAFB, the primary staging area is the 634th Air Mobility Support Squadron (AMSS) warehouse (see Figure 1). Cargo is inspected daily at these sites. These facilities are primarily used for day-to-day cargo staging, but may also be used for cargo related to a training exercise.

Temporary Snake-Sterile Staging Area (SSSA). When needed to support an influx of training materials and equipment, WS will assist military personnel to select the site for an SSSA for cargo that will be embarked from Guam. In addition to establishing an SSSA at or near a permanent staging area, other paved areas could be suitable.

An SSSA will be established when there will be a delay between BTS cargo inspection and movement to the loading point for aircraft or ship embarkation. The SSSA would be used to keep BTS from contaminating cargo that has been inspected, and to establish a controlled staging area for snake surveillance and trapping. The necessity to use an SSSA as part of the overall embarkation process will reviewed during major exercise planning conferences so that the steps may be included in embarkation plans. The need to use either permanent staging areas or an SSSA at other paved surfaces with low potential for BTS presence will be determined during pre-deployment conferences with WS assistance.

Snake Trapping. Snake trapping is conducted prior to construction of the SSSA on Guam. The time necessary to initiate the effort depends on the selected SSSA site and the nature of the exercise. If the SSSA will be established at AAFB Main and the FISC, snake-trapping activities are already being conducted. If an area elsewhere on Guam (such as Northwest Field, Ordnance Annex, or Orote Point) is going to be used, WS will initiate snake trapping 30 days prior to the exercise. Once the SSSA is erected, WS will conduct nightly spotlight searches in the area of the fence to augment area snake-trapping activities.

The SSSA uses a barrier system constructed with angled sections of weather shade netting on re-bar and PVC pipe supports, weighted along the bottom edge with water snakes and sandbags. The number of entry and exit points is minimized; these entry and exit points are designed to lead any BTS on the barrier toward a trap. The temporary barrier system is portable and can be set up to readily support fixed-wing operations at main airfields, helicopter operations at LZs, or ship offloads in port. A temporary SSSA planned for AAFB Main or the FISC would be erected 3 to 5 days prior to the exercise. Snake traps will be placed on the fencing and/or along the forest perimeter. WS personnel will be responsible for trap and portable fence line maintenance, including the care of mice used as an attractant, and trap cleaning.

Snake Detector Dog Teams. WS will use snake detector dogs (Jack Russell Terriers) to inspect outbound cargo and aircraft. The Snake Detector Dog Teams (each team consists of one dog and a handler) will be made available as necessary 24 hours per day, seven days a week.

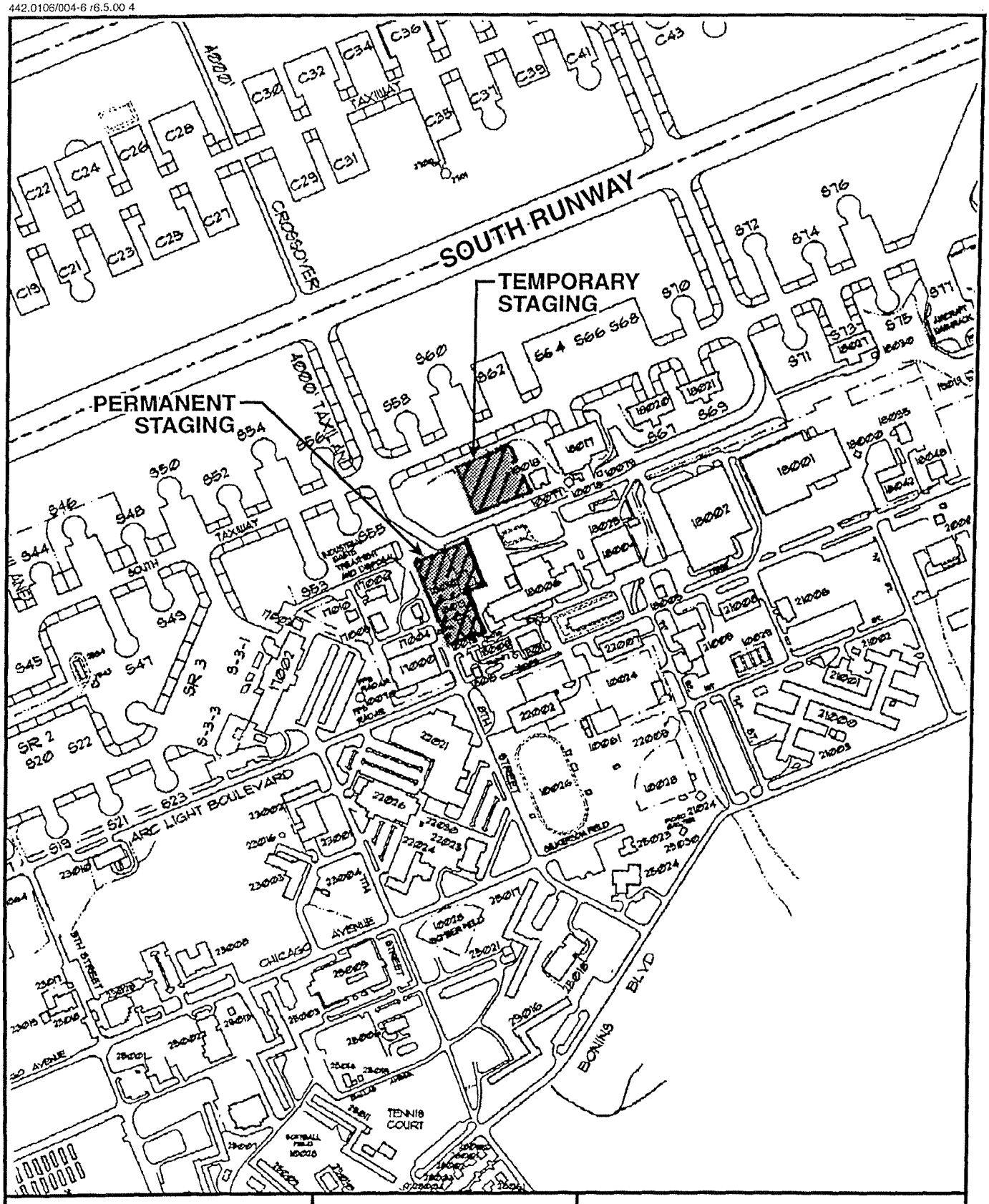


Figure A-1
ANDERSEN AIR FORCE BASE
CARGO STAGING AREAS
Marianas Training Handbook
Belt Collins Hawaii, June 2000

B. BTS Control Measures at COMNAVMARIANAS and AAFB Tent Cities

Site Selection. WS will be consulted to recommend areas of low BTS risk to be considered for developing Tent Cities (bivouac sites).

Trapping and Searching. WS will activate and monitor BTS traps surrounding the immediate vicinity of tent cities. WS Snake Detector Dog Teams will periodically walk through the area while troops are being staged prior to departure from Guam. Particular attention to BTS control measures is needed while breaking camp and re-packing tents and equipment susceptible to BTS infestation during bivouac and field training.

C. Cleaning Procedures

Responsibility. Prior to staging in a SSSA and embarkation aboard an aircraft or ship, each training unit will be responsible for cleaning its vehicles and equipment. For vehicles and equipment considered to be at high-risk for BTS contamination, additional procedures may be required such as high-pressure washing, steam-cleaning, fumigation, or other methods suggested by WS. These additional efforts will supplement any inspection conducted by cargo handlers, unit personnel, and WS.

Cleaning Facilities and Equipment. AAFB and COMNAVMARIANAS will provide cleaning areas. If cleaning equipment is unavailable or if the exercise scenario would increase the risk of snake infestation of vehicles, the training units may be tasked with augmenting or providing all necessary cleaning of equipment and supplies. To request installation support, training units may contact the following units:

- For AAFB: Call Vehicle Operations at 366-2239, 24 hours per day, 7 days per week.
- For COMNAVMARIANAS: Call the COMNAVMARIANAS Area Training Officer (Code N3) at 339-6141.

D. Inspection Procedures on Guam

General. The BTS inspection procedure is a joint military-WS effort. It includes individual user and cargo handler attention when packing materials for air and sea embarkation, and a subsequent thorough, systematic inspection of cargo, equipment, and vehicles by WS. To maintain open lines of communication among all involved, DoD will provide to WS the names of military contacts at the shipping or air terminals, and WS will keep the military points-of-contact informed of their BTS inspection activities.

BTS inspection processes are required for all outbound cargo. This includes inspections of equipment belonging to units stationed on Guam, and equipment that is transported to Guam by transient units from the continental U.S. (CONUS), Hawaii, or Japan for subsequent exercise support. Upon completion of the exercise, another inspection is required for equipment that will be cleaned, packed, and embarked for movement to off-island home installations.

Inspecting Personal Equipment. Military commanders are responsible for ensuring that all personal gear, hand-carried equipment and supplies, and tent canvas are inspected by WS as it is repacked when breaking camp. WS will assign Snake Detector Dog Teams to patrol the tent city area during the retrograde. To facilitate the inspection, personal equipment and tent canvas will be laid out for WS Snake Detector Dog Team inspection prior to palletizing or loading into shipping containers.

Inspecting Outbound Cargo. Table A-2 illustrates the decision process to determine the appropriate track to follow for cleaning, inspecting, (staging), and embarking cargo and equipment. The decisions are based on the nature of the training exercise and volume of cargo to be transported from Guam to an off-island location. The objectives are to minimize the timeline necessary between cleaning and embarking equipment, and to minimize the use of an SSSA without degrading BTS control and interdiction protocols. The military commander and WS cooperate in making these decisions.

Snake Detected or Suspected. If the Snake Detector Dog Team alerts to a possible BTS on a vehicle, pallet, or at the threshold of a locked container, the suspected equipment will not be moved. A second dog team will be brought on site to confirm the BTS presence. If the BTS is not discovered, the affected military unit will break out the cargo to allow BTS detection and elimination. If the BTS is not immediately found, WS will intensify its search and may activate additional traps in the vicinity of the affected shipment.

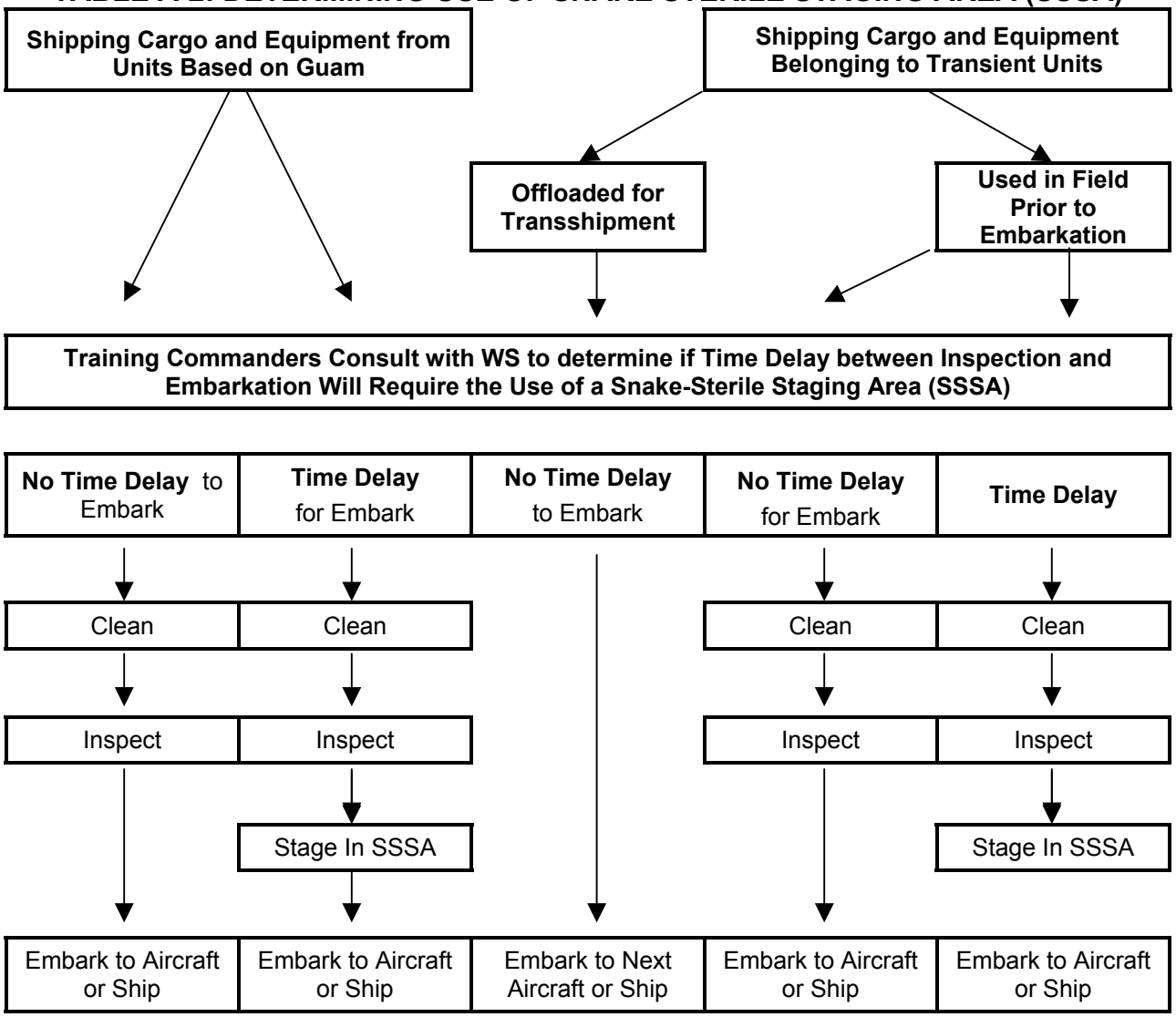
Reinspection. Cargo, vehicles, and equipment held within an SSSA for an extended period (e.g., during the night when snakes are active) may be subject to additional WS inspection prior to loading for departure. Likewise, any ship, barge, boat, or aircraft that was inspected and then left unattended may also be reinspected if deemed necessary by WS.

Schedule and Plan Modifications. WS plans its personnel and Snake Detector Dog Team assignments based on published exercise plans, and arrival/departure schedules. Sites to be used as SSSAs at ports of embarkation and debarkation are selected in advance and activated prior to the commencement of military exercises. Relocating established SSSAs might not be feasible. However, given reasonable time to react, WS may alter its personnel and Snake Detector Dog Team schedules and assigned cargo and vehicle inspection sites. Since BTS protocols take precedence when executing tactical troop and cargo movements from Guam, the arrival and departure schedules and points-of-contact will be verified by the military so that WS support will be on hand when expected.

Inspection Verification Process for Tinian Shipments. WS personnel will identify inspected items within Guam containment areas by affixing a stamp and/or tag to cargo or cargo manifest denoting the words “Snake-Inspected" together with date and time the inspection occurred.

WS will be especially watchful to ensure that airdrop cargo bound for Tinian has been thoroughly inspected and tagged.

TABLE A-2: DETERMINING USE OF SNAKE STERILE STAGING AREA (SSSA)



E. Inspection Procedures on Tinian

Military exercises may involve personnel, cargo, and equipment movement between Guam and Tinian, CNMI. (Staging and inspection processes similar to those employed at Tinian may be established at other island training sites.)

1. Prior to a training exercise commencing on Tinian, WS personnel will identify, purchase, and make arrangements with DoD to transport BTS control and interdiction tools and equipment such as temporary snake barrier components, snake capturing equipment, and lighting. WS personnel will train volunteering wildlife and/or customs officials to assist with BTS interdiction measures.

2. Supporting cargo shipped to Tinian in advance of the training exercise is subject to the routine cargo inspection process conducted daily by WS. No SSSA-type barrier may be required at Tinian harbor. WS will tag the cargo to confirm to CNMI Customs Inspectors that inspections were conducted on Guam.

3. Prior to arrival of the first military cargo from Guam to Tinian, WS will review the BTS protocol and necessary actions with the on-scene federal and CNMI wildlife and/or customs officials. In addition to assignment of responsible logistics personnel, exercise planning will include designating cargo offloading and staging areas and cargo DZs to be used. These areas will require employment of BTS control measures. WS will conduct BTS surveillance during nighttime cargo offloading, staging, and release of inbound traffic from Guam. WS will coordinate spotlight searches of staging areas, fence lines, and any tree lines/forest areas in proximity to runways/taxiways that are designated as drop zones. These areas will be targeted during inbound and exiting traffic times.

4. The majority of personnel, cargo, and equipment that deploy from Guam to Tinian are air-transported to North Field (preferred) or West Tinian Airport. Sections of angled weather shading will be used to establish a containment area for offloaded personnel and cargo. The portable barrier will be erected and maintained for about five days prior to the first shipment. Prior to commencement of the exercise, snake traps baited with a mouse will be installed along the barrier.

5. WS will maintain the BTS traps at the containment area throughout the duration of the training exercise. Some traps will be installed near parachute drop zones and near take-off zones. Additional BTS traps shall be made available for contingency plans and in case BTS sightings occur in the exercise area.

6. An anti-coagulant toxicant (contained within a tamper proof bait box) will be used in and around BTS trapping areas and near cargo containment/temporary snake barriers to reduce local rat populations. Removal of rats reduces the potential damage they can inflict to traps and barrier material.

7. CNMI DLNR may provide Snake Detector Dog Teams from Saipan on short notice if BTS presence is suspected.

8. When shipments reach Tinian, CNMI Customs Inspectors may check for the BTS inspection stamp/tag to verify that the inspection process was conducted on Guam. If there is no tag on cargo that originated in Guam, that cargo may be reloaded aboard the aircraft/ship and returned to Guam. The inspection stamp/tags will be removed prior to the cargo being moved out of the containment area or drop zone. It is important that the tags be removed to avoid any confusion when the equipment and vehicles are returned to Guam at the end of the exercise, and subsequently re-inspected prior to transient unit departures to home installations.

9. WS will maintain a log of all cargo, vehicle, equipment, and craft that are inspected and will monitor the time between inspection and movement. When requested, WS will provide copies of inspection logs and cargo manifests to CNMI Customs Inspectors. WS and CNMI DLNR will continue to support inspection and surveillance at Tinian's air and seaports of entry and exit until the exercise is formally terminated and military forces have departed.

V. GUIDELINES FOR BTS SIGHTINGS

Emergency Response Procedures are published for COMNAVMARIANAS and AAFB to contact Guam WS immediately (see Table A-1). Similar procedures have also been identified for publication at military bases in Hawaii, in case BTS are sighted or suspected in returning shipments. Procedures to obtain immediate support from the Hawaii Department of Agriculture and WS are found in Tables A-2 through A-5.

A. Immediate Action

1. **Make every attempt to kill or to capture the snake**. Do not delay. The cost and difficulty of trying to locate an escaped BTS, coupled with the potentially significant ecological impacts of each snake, justifies the killing or capturing of the snake immediately.

- A BTS can be captured by pinning it down with anything heavy (e.g., a stick, rifle butt, or boot heel). A sharp blow to the snake's head with the butt of an unloaded rifle or boot heel is usually fatal. If necessary, grab the snake behind the head.

- A bucket or heavy box can be used to trap a snake on a flat surface. Place the container over the head of the snake, leaving enough space for the snake to crawl completely underneath the container. Then weight it down to confine the BTS.

- Keep the dead snake available for positive identification by WS or an Environmental Monitor.

2. **Exercise caution.** When threatened, the BTS may coil back into a strike position, flatten its head, and lunge to bite. Small grooved fangs located in the rear of the mouth enable the mild venom to trickle into the bite while the snake constricts. A normal defensive strike from a BTS will not allow the rear fangs to penetrate the skin and will usually result in minor punctures similar to pinpricks. When wearing battle dress uniforms (BDUs) and field boots, a bite from a BTS will not penetrate clothing or footwear.

B. Notifications for BTS Sightings on Guam

In addition to killing or immobilizing the BTS so that it cannot escape, the person involved will then collect information of the incident that will describe the circumstances of the sighting, and remain on the scene to act as primary POC to other responders. WS may call upon the person who discovered the snake to obtain additional information.

1. When a BTS is sighted, killed and/or captured on Guam, or a BTS is suspected to be in a specific area, immediately contact the local area WS office, COMNAVMARIANAS and/or Commander. 36th ABW. The caller will provide the following information regarding BTS presence and will be given instructions regarding follow-on action:

    - Caller Identification:
    - Military Organization:
    - Sighting Location:

- Status: (Snake Killed/Captured/Contained/Loose)
- Date and Time of Sighting:
- Initial Response Action Underway at the Scene:

2. The telephone numbers to call during business hours are:

   - USDA APHIS WS Guam District Office: (671) 635-4400
   - USDA APHIS WS AAFB: (671) 366-3822
   - USDA APHIS WS COMNAVMARIANAS (671) 472-7101

   (WS personnel are on call 24 hours per day, seven days a week, and are equipped with cellular telephones. Cell phone numbers will be published prior to the exercise.)

3. During major exercises, the unit and/or COMNAVMARIANAS will contact the CESG, who will alert exercise personnel needed to respond and the COMNAVMARIANAS Quarterdeck at (671) 339-7133. Cellular telephone numbers will be published prior to major exercises for contact with command Environmental Monitors in the field.

4. Once notified of a sighting and circumstances, WS will dispatch personnel and/or BTS Detector Dog Teams to the scene. Military personnel will cooperate fully with WS in their inspection of the area, and also will provide any assistance needed to locate and capture a BTS.

C. BTS Sighting on Tinian or Other CNMI Sites

Reaction to a BTS sighting on Tinian and subsequent incident reporting procedures are the same as described above for sightings on Guam. Staff response during major military training exercises on Tinian may include representatives of CNMI Division of Fish and Wildlife, WS, and/or Navy Environmental Monitor staffs. All are equipped with cellular phones. The latter will have radio/telephone communication with the CESG.

Exercising caution, safety and discretion, the priority activity becomes killing, capturing, or containing the BTS. Report the incident, including the same information as needed for Guam BTS sightings, to CNMI Fish and Wildlife Saipan office immediately at (670) 664-6011 or to CNMI Tinian office at (670) 433-9298. CNMI may dispatch investigating personnel and Snake Detector Dog Team assistance. The WS and Navy Environmental Monitors/CESG will also be notified (via cellular phone numbers provided prior to the exercise).

D. Post-Training Exercise Snake Sighted in Hawaii

The Emergency Response Protocols established for snake sightings at Navy and Marine, Air Force, and Army installations on Oahu are found in Tables A-3 through A-6. The principal state agency that must be informed is the Hawaii Department of Agriculture (HDOA), Plant Quarantine Branch at (808) 586-7378 or 586-PEST.

Area Security Police will provide first response to sighting and inform NAVSTA dispatch at 71-7114 and the Department of Agriculture at 586-7378. First responders will collect information on the snake sighting, if it was killed or captured, and act as the primary POC to others responding to the scene. Security Police are trained in snake response equipment and techniques.

All civilian and military personnel will be briefed on BTS and trained to respond and comply with reporting procedures. The videotape "The Silent Invader" will be shown as part of this training. Training should be recurring. BTS posters will be displayed in buildings to remind personnel of the danger. The reporting number should be changed to the number for that area. For more information, contact the COMNAVBASE Pearl Harbor Regional Conservation Coordinator, at 471-0326, or Environmental Protection Specialist at 471-1171, extension 233. The alternate number is 471-1171, extension 225 (pager number 361-4864).

TABLE A-3
U.S. NAVY BASES IN HAWAII - BTS EMERGENCY RESPONSE PROTOCOLS

SNAKE SIGHTED ON NAVY PROPERTY:
1. KILL OR IMMOBILIZE THE SNAKE
2. MAINTAIN VISUAL CONTACT

IF SIGHTING IS IN OR AROUND THE PEARL HARBOR NAVAL COMPLEX:

Navy Housing, Naval Station, Pearl Harbor Naval Shipyard, Fleet Industrial Supply Center, Naval Intermediate Maintenance Facility, Public Works Center

CINCPACFLT, PACDIV, Inactive Ships, and all Navy Commands in the Area:

CALL NAVAL STATION SECURITY POLICE
471-7114

IF SIGHTING IS OUTSIDE THE PEARL HARBOR NAVAL COMPLEX: CALL SECURITY POLICE IN THAT AREA

Pacific Missile Range Facility, Kauai	Naval Magazine, Lualualei	Naval Computer and Telecommunications Master Station	Naval Security Group Activity, Kunia
471-6523	668-7114	653-0000	655-3200
471-4185	471-5141	653-0234	655-3205

TABLE A-4
HICKAM AIR FORCE BASE - BTS EMERGENCY RESPONSE PROTOCOLS

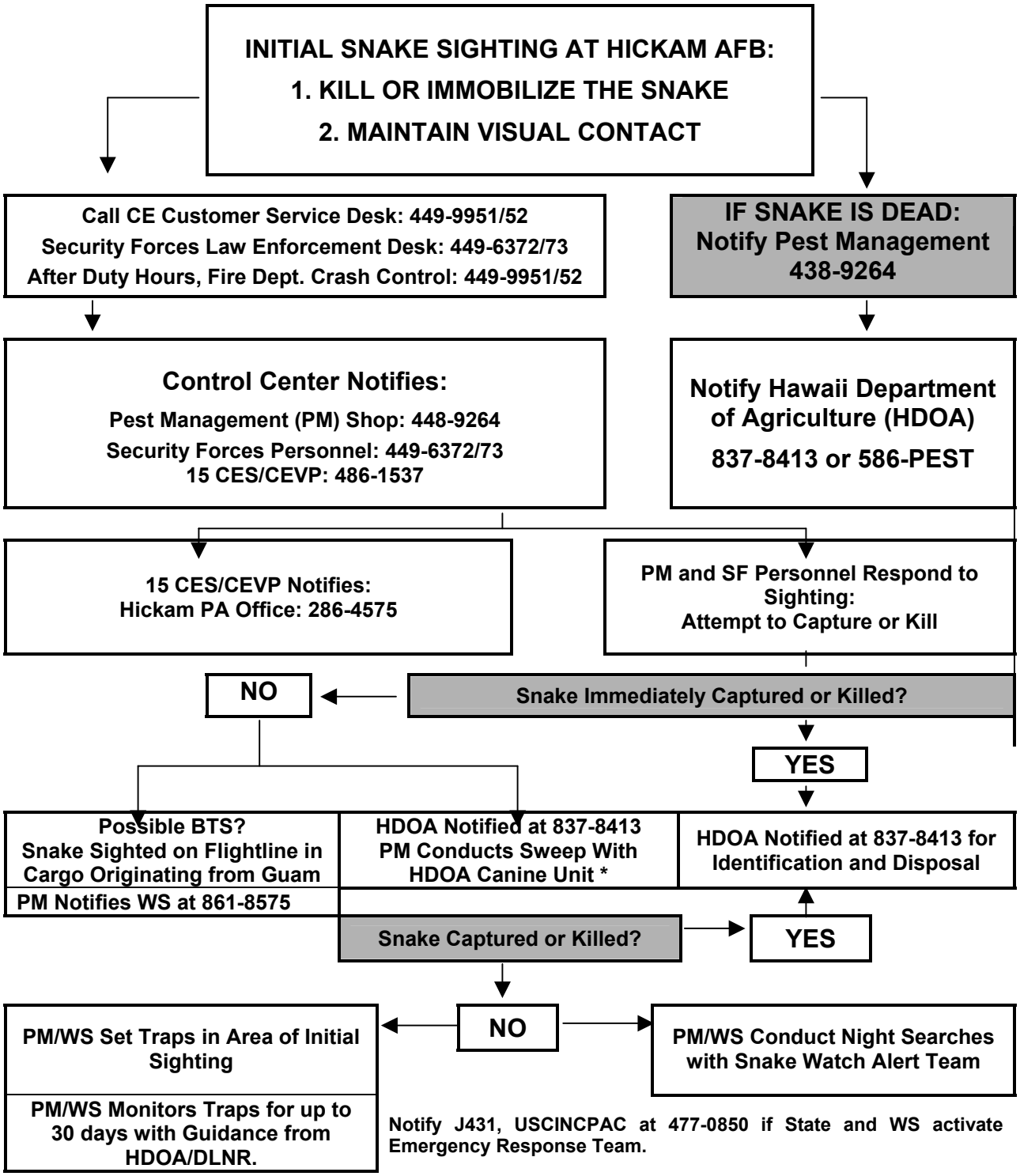
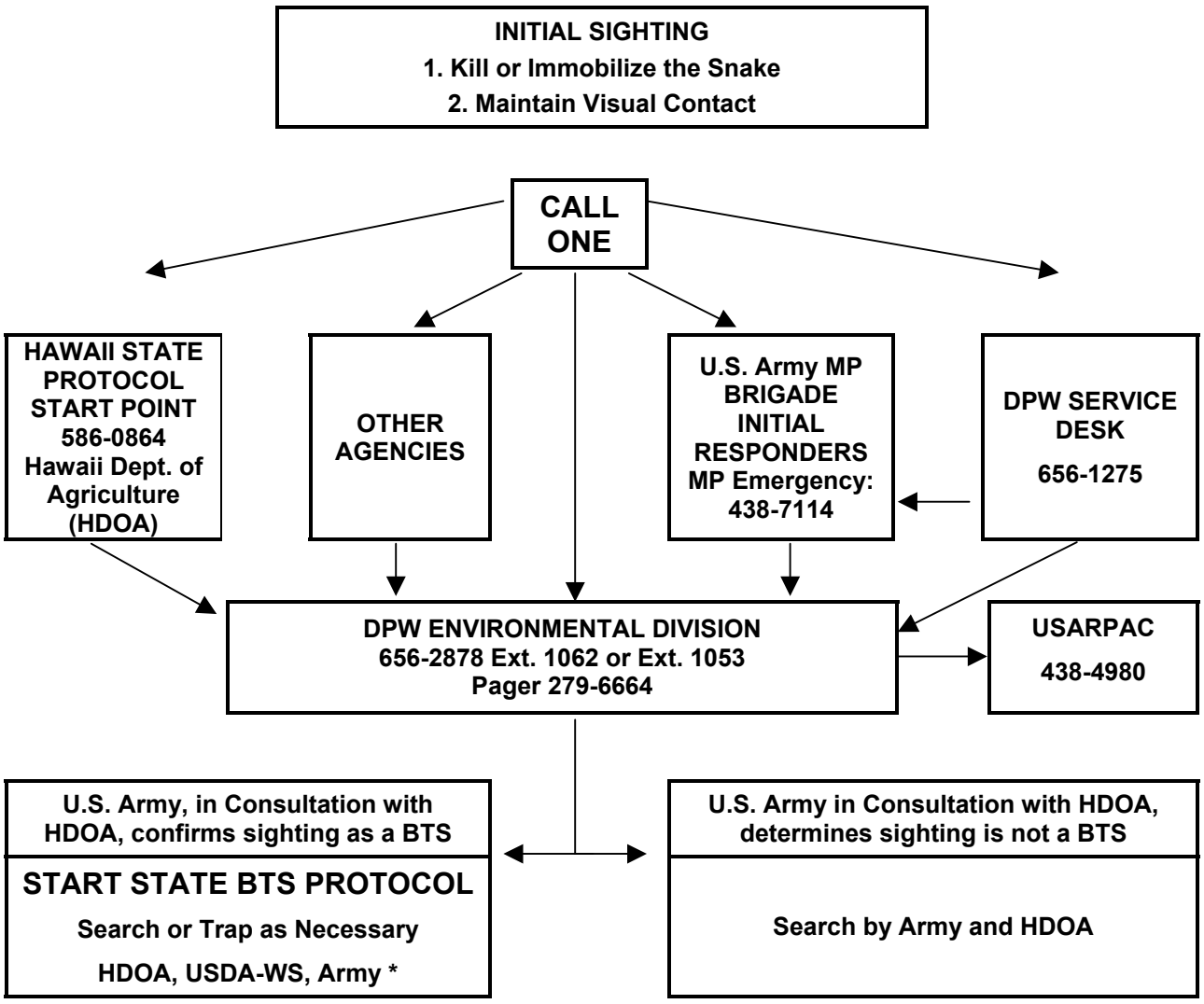
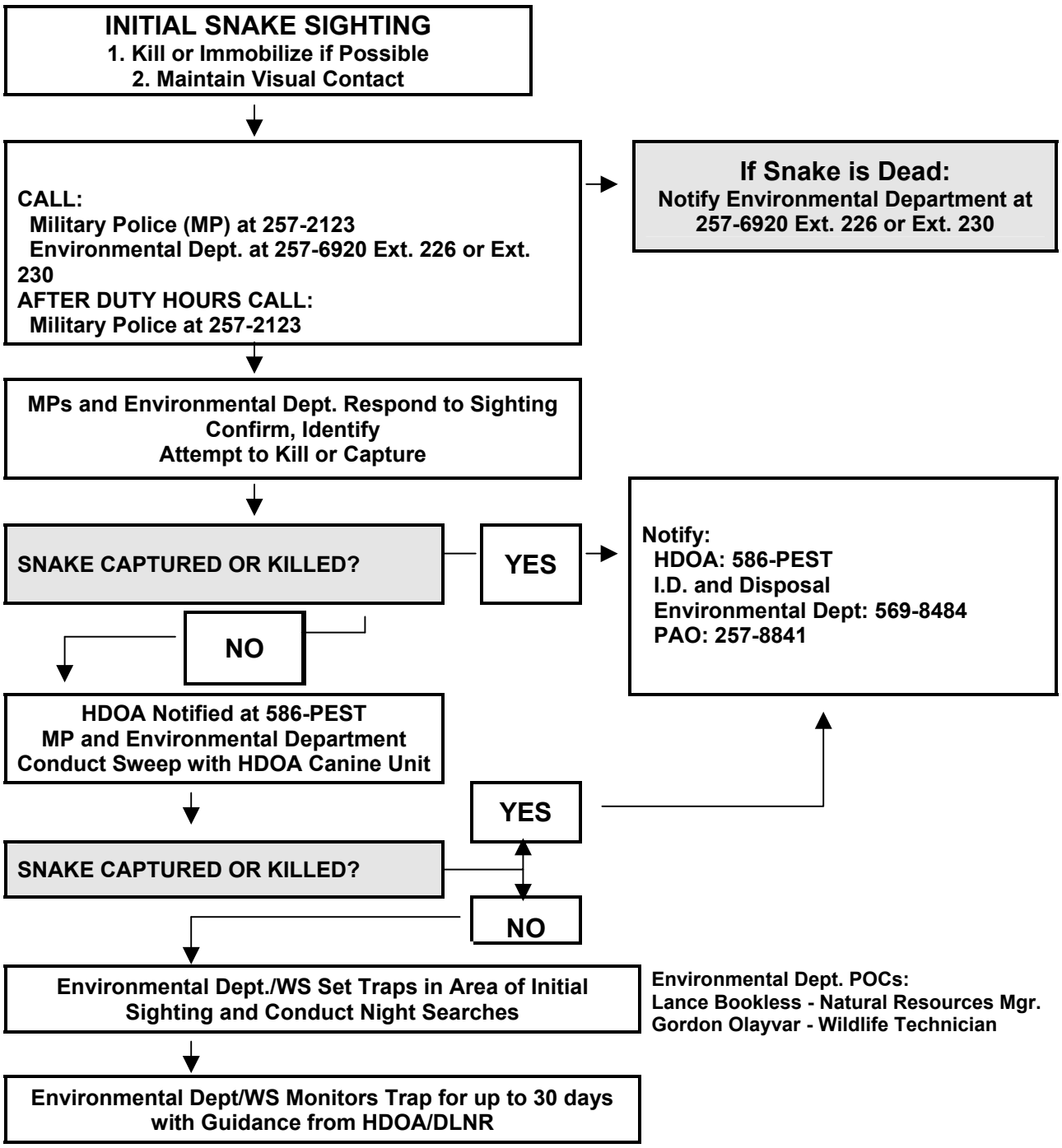


TABLE A-5
UNITED STATES ARMY GARRISON-HAWAII – BTS EMERGENCY SIGHTING PROTOCOLS



If State and WS Emergency Response Team are dispatched to military installations, notify J421, USCINCPAC at 477-0850.

TABLE A-6
MARINE CORPS BASE HAWAII, KANEOHE BAY — BTS
EMERGENCY SIGHTING PROTOCOLS



APPENDIX B List of Projects

Appendix B: List of Projects

Project No. 67155 NR	Project Name	Project Description	Management Area				Alternative		
			FM	LM	FW	OR	Proposed	Enhanced	No Action
6	INRMP Update, FDM and Tinian MLAs	Update the FDM and Tinian MLA INRMP	X	X	X	X	X	X	
12	Endangered Species Mitigation, FDM	Habitat protection and enhancement for Micronesian megapodes to mitigate for military training on FDM as per USFWS BO (1-2-98-F-03). Historically, the Navy has improved Micronesian megapode habitat elsewhere in the Marianas (e.g., Sarigan and Anatahan).			X		X	X	X
13	Species Survey, FDM	Annual marine surveys of marine environs around FDM to access impacts of military training.			X		X	X	X
31	Tinian Reforestation, Tinian	Reforestation of Native Trees on Military Leased Areas. The geographic area would be in proximity to the existing limestone forest in the EMUA, but the precise location and acreage have not been determined. To be replaced by 61755NR122 beginning in FY05.	X		X			X	
101	Conservation Mapping, Tinian and FDM	Complete ArcGIS 8.3 Geographic Information System for Tinian and FDM MLAs.		X				X	
117	Avian Survey, Tinian and FDM	Design and implementation of a statistically valid avian survey, including seabirds and migratory birds, on military leased lands on Tinian and FDM.			X			X	
118	Megapode Survey, Tinian	Update to the 2001 Navy sponsored Micronesian megapode population survey on Tinian. The trend data would be useful in monitoring the species' population success on Tinian MLA.			X		X	X	
119	Hagoi Moorhen Management Plan, Tinian	Preparation of a long-term management plan for the Mariana common moorhen population at Hagoi, Tinian. Includes management actions needed to conserve and enhance habitat, predator control, and species monitoring.		X	X		X	X	
120	Outdoor Recreation Planning, Tinian	Development of an integrated outdoor recreation plan to support the Tinian/FDM INRMP.				X		X	
121	Ecosystem Health Indicator Study, Tinian	Design and implementation of a statistically valid survey of the biodiversity indicator species, coconut crab, on Tinian. The coconut crab is considered a suitable indicator of ecosystem health on Tinian. The location of the study area has not been determined. Restricted access prevents comparable data collection on FDM.			X		X	X	
122	Native Forest Enhancement, Tinian	Underplanting native forest species on 30-acres per year on Tinian to improve habitat for T/E species and enhance biodiversity.	X		X		X	X	
123	Sea Turtle Monitoring, Tinian	Five-year satellite radio tagging study of endangered sea turtles on Tinian to develop baseline data on seasonal movement of sea turtles.			X		X	X	
124	Marine Resource Study, Tinian	Design and implementation of a statistical valid long-term monitoring survey of the marine biodiversity within military leased lands on Tinian.			X		X	X	
125	Vegetation Survey, Tinian	Mapping, describing, and field verification of vegetation and plant communities within military lease lands on Tinian.		X	X			X	
126	Long-Term Resource Monitoring, Tinian	Establishment of long-term natural resources monitoring plots on military leased lands on Tinian.			X			X	
127	Wetland Delineations, Tinian	Mapping, describing, and field verification of wetland within the military leased areas on Tinian for approval by Army Corps of Engineers.		X			X	X	
410	Species Survey, Tinian and FDM	Continuation of monthly wildlife surveys of FDM and Tinian by Navy Biologist. A Navy biologist conducts the surveys of FDM avifauna via helicopter and within the Tinian MLA, the survey is on foot within Lake Hagoi and along established transects in native forest areas.			X		X	X	X

APPENDIX C

Agency Correspondence

APPENDIX C: AGENCY CORRESPONDENCE

This Appendix includes copies of correspondence between agencies and the Navy regarding the EA. The letters are presented by agency in the following order:

Federal
U.S. Fish and Wildlife Service (including informal Section 7 consultation letters)
National Marine Fisheries Service
Natural Resources Conservation Service

CNMI
Department of Lands and Natural Resources
Coastal Resources Management Office
Department of Environmental Quality

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HI 96860-3134

11015.4G20
Ser PLN232/
5 FEB 2004

Ms. Gina Shultz
Acting Field Supervisor
U.S. Fish and Wildlife Service
Pacific Islands Ecoregion
Box 50088
Honolulu, HI 96850

Dear Ms. Shultz:

Subj: INFORMAL SECTION 7 CONSULTATION, INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN, FARALLON DE MEDINILLA AND TINIAN MILITARY LEASED AREAS

The Navy is in the final phase of completing the Integrated Natural Resources Management Plan (INRMP) for Farallon De Medinilla and Tinian Military Lease Areas, Commonwealth of the Mariana Islands. This is a programmatic document that, in part, identifies ecosystem-based management strategies that guide Navy actions to protect and enhance endangered and threatened species and their habitat. The U.S. Fish and Wildlife Service (USFWS) was provided a copy of the draft INRMP for review and provided comments on October 24, 2003.

Section 7(a)(2) of the Endangered Species Act (ESA) requires all Federal agencies to review their programs and actions to ensure that they are not likely to jeopardize the continued existence of any listed species or designated critical habitat. Regarding the subject INRMP, the Navy has reviewed the document and has determined that its implementation will not adversely affect any such species or habitat. We have reached this conclusion based on the following considerations:

a. The following species are listed as threatened or endangered under the ESA within the INRMP area:

Micronesian megapode (*Megapodius laperouse*)
Marianas common moorhen (*Gallinula chloropus guami*)
Mariana mallard (*Anas oustaleti*)
Tinian monarch (*Monarcha takatsukasae*)
Green sea turtle (*Chelonia mydas*)
Hawksbill sea turtle (*Eretmochelys imbricata*)

b. Although future, yet unidentified, Navy actions within the area covered by the INRMP may adversely affect the above-listed species; these actions will be addressed in separate, future formal section 7 consultations with USFWS.

c. Numerous actions are proposed in the INRMP that will aid in the conservation of listed species. Should the Navy determine that implementation of any of these beneficial actions has any potential to have ancillary or unintended adverse impacts; the Navy will contact the Service for consultation as required by section 7.

As required by subsection 402.13 of the section 7 regulations, we seek your concurrence with our determination that implementing the INRMP for Farallon de Medinilla and Tinian Lease Areas will not adversely affect any listed species or habitat.

Thank you for your consideration of this request. Should you have any questions or comments, please contact the undersigned at 471-9338 or by E-Mail at Melvin.Kaku@navy.mil or Mr Timothy Sutterfield at 474-5923 or by E-Mail Timothy.Sutterfield@navy.mil.

Sincerely,

MELVIN N. KAKU
Director
Environmental Planning Division

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard
Room 3-122, Box 50088
Honolulu, Hawai`i 96850

In Reply Refer To:
1-2-2004-I-108

JUN 0 9 2004

Melvin N. Kaku, Director
Environmental Planning Division
U.S. Department of the Navy
Pacific Division
Naval Facilities Engineering Command
258 Makalapa Drive, Suite 100
Pearl Harbor, Hawaii 96860-3134

Subject: Informal Section 7 Consultation on Pre-Final Navy Integrated Natural Resources Management Plan (INRMP) for Farallon de Medinilla and Tinian Military Leased Ares (Navy reference number: 11015.4G20 Ser PLN232/)

Dear Mr. Kaku:

Thank you for your letter dated February 5, 2004, requesting informal consultation under section 7 of the Endangered Species Act for the subject Integrated Natural Resources Management Plan (INRMP) for areas in the Commonwealth of the Northern Mariana Islands (CNMI). We received your request on February 6, 2004.

We understand that you have determined that implementation of the subject INRMP will not adversely affect any of the following species:

Micronesian megapode (*Megapodius laperouse*)
Mariana common moorhen (*Gallinula chloropus guami*)
Mariana mallard (*Anas oustaleti*)
Tinian monarch (*Monarcha takatsukasae*)
Green sea turtle (*Chelonia mydas*)
Hawksbill sea turtle (*Eretmochelys imbricata*)

We also understand from your letter that future, yet unidentified, Navy actions within the area covered by the INRMP may adversely affect listed species, and you plan to address those actions in separate, future formal section 7 consultations with our office.

The Navy's INRMP is a programmatic document that, in part, identifies ecosystem-based management strategies that guide Navy actions to protect and enhance endangered and threatened species and their habitat. We agree with your statement that numerous actions proposed in the INRMP will aid in the conservation of listed species.

Based on information provided in the pre-final INRMP, in subsequent meetings and discussions with your staff, and information in our files, we concur with your determination that the general activities outlined in the pre-final INRMP are not likely to adversely affect Micronesian megapode, Mariana common moorhen, Tinian monarch, Green sea turtle, and Hawksbill sea turtle. Please note that on February 23, 2004 the Mariana mallard, formerly an endangered species, was removed from the list of endangered species due to extinction.

We appreciate the opportunity we have had to work with you and your staff to ensure that the Marianas INRMP complies with section 7 of the Act. If you have any questions, please contact Vertebrate Conservation Program Leader Marilet A. Zablan (phone: 808/792-9400, fax: 808/792-9450).

Sincerely,

Nicole Alt
Acting Field Supervisor

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

TAKE PRIDE IN AMERICA

In Reply Refer To:
PN-04-200

JUN 18 2004

Commander
Pacific Division
Naval Facilities Engineering Command
ENV 183
258 Makalapa Drive, Suite 100
Pearl harbor, HI 96860-3134

Re: Draft Environmental Assessment for the Integrated Natural Resources Management Plan, Farallon De Medinilla and Tinian Military Lease Areas, Commonwealth of the Northern Mariana Islands

Dear Commander:

The U.S. Fish and Wildlife Service (Service) has reviewed the April 2004 Draft Environmental Assessment (DEA) for the Integrated Natural Resources Management Plan (INRMP) for Farallon De Medinilla (FDM) and Tinian Military Lease Areas (MLAs) in the Commonwealth of the Northern Mariana Islands (CNMI). The DEA and INRMP were prepared by the Department of the Navy (Navy). The Service appreciates the extension of time given by the Navy on the DEA comment period. This letter has been prepared under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 et seq.; 83 Stat. 852], as amended, the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 et seq.; 48 Stat. 401], as amended, the Endangered Species Act of 1973 [16 U.S.C. 1531 et seq.; 87 Stat. 884], as amended (ESA), and other authorities mandating Service concern for environmental values. Based on these authorities, the Service offers the following comments for your consideration.

The Navy proposes to implement the INRMP to manage, conserve, and rehabilitate natural resources within the MLAs, in compliance with the Sikes Act Improvement Act (SAIA). The DEA is programmatic in nature in that it evaluates the impacts of adopting and implementing the INRMP to determine whether preparation of an environmental impact statement is warranted. The DEA analyzes a Proposed Action, and two alternatives (Enhanced Action and No Action).

The Proposed Action consists of goals and objectives within four natural resource management categories: Forest management; Fish and Wildlife Management; Land Management; and Outdoor Recreation Management. The Enhanced Action Alternative is to implement a greater number of projects than the Proposed Action. The No Action Alternative is to not adopt the INRMP, which would not comply with the SAIA.

On May 18, 2004, the Service and the Navy met to discuss several unresolved concerns related to insufficient information in the Pre-Final INRMP. As a result, these concerns were resolved to the mutual satisfaction of both parties, and the resolutions will be reflected in the Final INRMP. Similar information deficiencies are present in the DEA. Specifically, the DEA does not adequately identify the significant fish and wildlife resources in the proposed action area and describe the scope of the Proposed Action based on the outcome of this discussion. We recommend that the Final Environmental Assessment include additional information on significant fish and wildlife resources in the proposed action area and identify additional relevant actions that will be implemented by the Navy as part of the Proposed Action.

Although the Service supports implementation of the greatest number of INRMP projects in the MLAs, neither the Proposed Action nor the Enhanced Action Alternative is considered to be environmentally damaging. In addition, consultation under section 7 of the ESA was completed on June 9, 2004, and the Service concurred with the Navy's determination that the INRMP was not likely to adversely affect listed species under our jurisdiction. Accordingly, the Service does not anticipate significant adverse impacts to fish and wildlife resources to result from implementation of the Proposed Action. Therefore, the Service would concur with a Finding of No Significant Impact (FONSI) determination for implementation of the Proposed Action.

The Service appreciates the opportunity to comment on the DEA. If you have any questions regarding these comments, please contact my Environmental Review Coordinator, Michael Molina, at 808/792-9440.

Sincerely,

for Nicole Alt
Acting Field Supervisor

cc: NMFS-PIRO, Honolulu
EPA-Region IX, San Francisco
DLNR, CNMI
DFW, CNMI
CRMO, CNMI
DEQ, CNMI

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HI 96860-3134

5090P.1G0B
Ser ENV1831/1224

15 JUL 2004

Ms. Nicole Alt
United States Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122,
Box 50088
Honolulu, HI 96850

Dear Ms. Alt:

Subj: AGENCY REVIEW OF THE DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR THE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP), FARALLON DE MEDINILLA AND TINIAN MILITARY LEASE AREAS (MLA), COMMONWEALTH OF THE NORTHERN MARIANAS ISLANDS

Thank you for participating in the agency review of the subject EA. This letter provides responses to your letter United States Department of the Interior Fish and Wildlife Service (USFWS) Referenced as PN-04-200 of June 18, 2004.

Comment 1: "On May 18, 2004, the Service and the Navy met to discuss several unresolved concerns related to insufficient information in the Pre-Final INRMP. As a result, these concerns were resolved to the mutual satisfaction of both parties, and the resolutions will be reflected in the Final INRMP. Similar information deficiencies are present in the DEA. Specifically, the DEA does not adequately identify the significant fish and wildlife resources in the Proposed Action area and describe the scope of the Proposed Action based on the outcome of this discussion. We recommend that the Final Environmental Assessment include additional information on significant fish and wildlife resources in the Proposed Action area and identify additional relevant actions that will be implemented as part of the Proposed Action."

Response: Based on the meeting on May 18, 2004, the USFWS concurred with the INRMP in a letter dated June 22, 2004. The concerns discussed during the meeting were summarized in an addendum attached to the letter. Based on the discussions it was agreed to that the majority of the concerns with the INRMP were to be included in subsequent INRMP updates. For the Final INRMP to be printed later this year following the completion of the EA, the Navy's Brown Tree Snake Interdiction Plan will be added to the INRMP, discussion of marine mammals will be added and typographic errors as pointed out by the USFWS were corrected. Based on changes made to the INRMP, the following revisions were made to the INRMP EA:

Section 1.2, 1st Paragraph: "As shown on Figure 1, Tinian and FDM are located within CNMI. The MLAs, indicated by shading, encompass all land areas of FDM and the northern portion of Tinian. The MLAs include the land area and "nearshore waters," which are not clearly defined in the lease agreements. The Navy does not have marine resource management responsibility;

however, the INRMP would address impacts on those marine resources that are dependent upon intertidal waters for nesting or foraging."

Section 3.1, 1st Paragraph and Section 3.2, 1st Paragraph (for Tinian): "Per the lease agreement with the CNMI, the FDM MLA does not include the deeper marine waters located seaward of the coastal ecosystem. The discussion of marine biotic community is limited to those marine resources whose life cycles are dependent on the coastal ecosystem. For example sea turtles are dependent on intertidal areas for foraging on algae and seagrasses, and nesting, while the life cycles of other marine species that are observed in the vicinity of FDM (e.g., humpback and other whales, and dolphins) are not directly dependent on coastal ecosystems and are not discussed."

Figures 2 & 3 annotated to clarify limits of MLA, and the spelling of *Fregata minor* and the common and scientific names for the Mariana swiftlet (*Aerodramus bartsch*) were corrected in the EA.

The Navy appreciates USFWS's review of the EA for the INRMP. Our points of contact for the EA is Ms. Paulette Chang at (808) 472-1383 or via E-Mail at paulette.chang@navy.mil and for the INRMP is Mr. Timothy Sutterfield at (808) 472-1383 or via E-Mail at timothy.sutterfield@navy.mil or by facsimile transmission at (808) 474-5419.

Sincerely,

Melvin Z. Waki

MELVIN Z. WAKI, P.E.
Head
Environmental Engineering Department

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Boulevard, Suite 1110
Honolulu, Hawaii 96814-0047

Commander
Pacific Division
Naval Facilities Engineering Command
ENV 183
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96860-3134

MAY 12 2004

RE: Environmental Assessment for the Integrated Natural Resources Management Plan, Farallon de Medinilla and Tinian Military Lease Areas

Please reference Consultation No. I-PI-04-341:MMD

Dear Commander:

This letter responds to your request, received by the National Marine Fisheries Service (NOAA Fisheries) on April 15, 2004, for comment on the Navy's Environmental Assessment (EA) for the Integrated Natural Resources Management Plan (INRMP), Farallon de Medinilla (FDM) and Tinian Military Lease Areas (MLAs). NOAA Fisheries fully supports the Navy's efforts to bring the FDM and Tinian MLAs into compliance with the Sikes Act by preparing the INRMP and associated EA. We are pleased to provide the following comments on the document:

1) The extent of the marine portion of the MLAs and the marine area covered by the INRMP is not clear from the EA. In particular, the analysis should identify the extent of marine waters that will be affected by INRMP activities (i.e., the seaward extent of impacts).

2) Figure 3: It appears that the Fish and Wildlife Management Area near Unai Lam Lam is included in the No Action Alternative and the Enhanced Alternative, but not the Proposed Action. Since the Proposed Action appears to build on the management measures associated with the No Action Alternative, this is counterintuitive.

3) Section 3.1.1: Humpback whales also may be present in waters near the MLAs. To the extent that the marine portion of the MLAs and the INRMP extend to those waters (see comment #1, above), a discussion of humpback whales should be included.

4) Section 3.2.1: The discussion of the presence of sea turtles on Tinian should be expanded. A recent study provides details on the presence of sea turtles at Tinian; see Kolinski, Steven P. 2001. *Sea Turtles and Their Marine Habitats at Tinian and Aguijan, with Protections on Resident Turtle Demographics in the Southern Arc of the Commonwealth of the Northern Mariana Islands*, Honolulu Laboratory, Southwest Fisheries Science Center, NOAA Fisheries. Administrative Report H-01-06C. Notably, the study indicates that the Commonwealth of the Northern Mariana Islands, and Tinian in particular, is primary resident green turtle habitat.

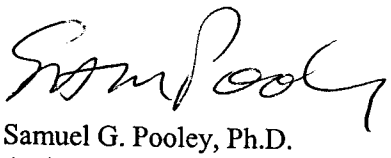
5) Section 3.2.2, under **Fauna**: The information on the illegality of taking sea turtles (and other federally-listed species) should be moved to the T/E section 3.2.1.

6) Section 4.0: While the analysis needs to (and does) state the extent of the adverse impacts associated with each of the alternatives, the section should also identify the positive impacts of those alternatives. This is because the positive effects constitute the primary differences between the alternatives. A discussion of the positive impacts would enable the reader to understand why the Navy has selected the Proposed Action vs. the Enhanced Alternative (e.g., the benefits associated with the Enhanced Alternative might be minimal relative to the added costs of the expanded program) and to understand the marginal contributions of each alternative to the management of the MLAs' resources.

7) Section 4.0: The section should indicate that specific projects will require section 7 consultation with NOAA Fisheries, either by the Navy or by the action agenc(ies) undertaking those projects (e.g., the U.S. Fish and Wildlife Service's proposed sea turtle tagging program).

Once again, NOAA Fisheries appreciates the opportunity to comment on the Draft EA. We look forward to working with you on the continued development of the INRMP for the FDM and Tinian MLAs. Please contact Sarah Malloy in my office, at (808) 973-2937, with further questions or comments regarding this letter.

Sincerely,



Samuel G. Pooley, Ph.D.
Acting Regional Administrator

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HI 96860-3134

5090P.1G0B
Ser ENV1831/1227
15 JUly 2004

Mr. Samuel G. Pooley, PhD
Acting Regional Administrator
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Pacific Islands Regional Office
1601 Kapiolani Boulevard, Suite 1110
Honolulu, HI 96814

Dear Mr. Pooley:

Subj: AGENCY REVIEW OF THE DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR THE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP), FARALLON DE MEDINILLA AND TINIAN MILITARY LEASE AREAS (MLA), COMMONWEALTH OF THE NORTHERN MARIANAS ISLANDS

Thank you for participating in the agency review of the subject EA. This letter provides responses to your National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) letter of May 12, 2004 referenced as Consultation No. I-PI-04-341:MMD.

Comment 1: "The extent of the marine portion of the MLAs and the marine area covered by the INRMP is not clear from the EA. In particular, the analysis should identify the extent of marine waters that will be affected by INRMP activities (i.e. the seaward extent of impacts)."

Response: A separate Marine Resource Assessment is in progress to determine resources in the marine environment. However, the lease agreement with the Commonwealth of the Northern Marianas Islands (CNMI) for Farallon de Medinilla (FDM) does not give marine resource management responsibility to the Navy. According to the lease, the FDM training range includes the island and "nearshore" waters, which is not clearly defined. Therefore, the marine environment is not covered by the INRMP. The following revisions were made in the EA:

Section 1.2, 1st Paragraph: "As shown on Figure 1, Tinian and FDM are located within CNMI. The MLAs, indicated by shading, encompass all land areas of FDM and the northern portion of Tinian. The MLAs include the land area and "nearshore waters," which are not clearly defined in the lease agreements. The Navy does not have marine resource management responsibility; however, the INRMP would address impacts on those marine resources that are dependent upon intertidal waters for nesting or foraging."

Section 3.1, 1st Paragraph and Section 3.2, 1st Paragraph (for Tinian): "Per the lease agreement with the CNMI, the FDM (Tinian) MLA does not include the deeper marine waters located seaward of the coastal ecosystem. The discussion of marine biotic community is limited to those marine resources whose life cycles are dependent on the coastal ecosystem. For example sea turtles are dependent on intertidal areas for foraging on algae and seagrasses, and nesting, while the life cycles of other marine species that are observed in the vicinity of FDM (Tinian) (e.g., humpback and other whales, and dolphins) are not directly dependent on coastal ecosystems and are not discussed."

Comment 2: "Figure 3: It appears that the Fish and Wildlife Management Area near Unai Lam Lam is included in the No Action Alternative and the Enhanced Alternative, but not the Proposed Action. Since the Proposed Action appears to build on the management measures associated with the No Action Alternative, this is counterintuitive."

Response: Figure 3 will be corrected in the Final EA to show the Fish and Wildlife Management Area near Unai Lam Lam for the Proposed Action.

Comment 3: "Section 3.1.1: Humpback whales also may be present in waters near the MLAs. To the extent that the marine portion of the MLAs and the INRMP extend to those waters (see comment #1, above), a discussion of humpback whales should be included."

Response: The presence of humpback whales is mentioned in the INRMP. Changes in the EA were made per Comment 1.

Comment 4: "Section 3.2.1: The discussion of the presence of sea turtles on Tinian should be expanded. A recent study provides details on the presence of sea turtles at Tinian; see Kolinski, Steven P. 2001. Sea Turtles and Their Marine Habitats at Tinian and Aguijan, with Protections on Resident Turtle Demographics in the Southern Arc of the Commonwealth of the Northern Marianas Islands, Honolulu, Laboratory, Southwest Fisheries Science Center, NOAA Fisheries. Administrative Report H-01-06C. Notably, the study indicates that the Commonwealth of the Northern Marianas Islands, and Tinian in particular is primary resident green turtle habitat."

Response: The following revisions were made in the EA:

Section 3.2.1, 2nd Paragraph, "Green sea turtles (Federally listed as threatened) and occasionally hawksbill sea turtles (Federally listed as endangered) are observed in coastal waters. Tinian has been identified as a primary resident green turtle habitat with a predominance of juveniles (Kolinski, 2001). It is illegal to take sea turtles, including sea turtle eggs."

Comment 5: "Section 3.2.2 under Fauna: The information on the illegality of taking sea turtles (and other federally listed species) should be moved to the T/E section 3.2.1."

Response: The information will be moved to Section 3.2.1 in the Final EA.

Comment 6: "Section 4.0: While the analysis needs to (and does) state the extent of the adverse impacts associated with each of the alternatives, the section should also identify the positive impacts of those alternatives. This is because the positive effects constitute the primary differences between the alternatives. A discussion of the positive impacts would enable the reader to understand why the Navy has selected the Proposed Action vs. the Enhanced Alternative might be minimal relative to the added costs of the expanded program) and to understand the marginal contributions of each alternative to the management of the MLAs' resources."

Response: The following revisions were made to the EA:

Section 4.1, 3rd Paragraph: "The more projects completed under the Proposed Action or alternatives, the greater the beneficial impact on FDM MLA's biological resources. The Enhanced Alternative would include two projects in addition to those under the Proposed Action, and would have more beneficial impact on FDM's biological resources than either the Proposed Action or No Action Alternative. On completion of the Proposed Action, the additional projects described under the Enhanced Alternative will be considered for implementation subject to the availability of funding."

Section 4.2, 4th paragraph: "The Enhanced Alternative would include six projects in addition to those of the Proposed Action, and would have more beneficial impact on Tinian's biological resources than either the Proposed Action or No Action Alternative. On completion of the Proposed Action, the additional projects described under the Enhanced Alternative will be considered for implementation subject to the availability of funding."

Comment 7: "Section 4.0: This section should indicate that specific projects will require section 7 consultation with NOAA Fisheries, either by the Navy or by the action agency(ies) undertaking those projects (e.g, the U.S. Fish and Wildlife Service's proposed sea turtle tagging program)."

Response: Reference to Section 7 consultation will be included in the Final EA. The following revisions were made to the EA:

Section 4.2, 2nd paragraph: "Of the monitoring and survey projects proposed, only the Sea Turtle Monitoring Study, Tinian MLA (Project 67155NR123) involves handling T/E species. Per ESA, any handling of T/E species has potential for adverse impacts on the sea turtles and ESA Section 7 consultation with NMFS and USFWS will occur prior to tagging animals. Project 67155NR123 is included in the Proposed Action and the Enhanced Alternative. The Navy's role in these projects would be limited to providing satellite time and monitoring units (tags) to USFWS or CNMI, who would be responsible for obtaining necessary permits, animal tagging, and data compilation."

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Ser ENV1831/1227

The Navy appreciates NOAA NMFS's review of the EA for the INRMP. Our points of contact for the EA is Ms. Paulette Chang at (808) 472-1383 or via E-Mail at paulette.chang@navy.mil and for the INRMP is Mr. Timothy Sutterfield at (808) 472-1383 or via E-Mail at timothy.sutterfield@navy.mil or by facsimile transmission at (808) 474-5419.

Sincerely,

MELVIN Z. WAKI, P.E.
Head
Environmental Engineering Department

United States Department of Agriculture

NRCS Natural Resources Conservation Service

Saipan Field Office
P.O. Box 5082 CHRB
Saipan, MP 96950
Ph: (670) 236-0881; Fax: (670) 236-0889

Date: Thursday, May 06, 2004 **File Code**: 150

Subject: Agency Review of the Environmental Assessment for the Integrated Natural Resources Management Plan, Farallon de Medinilla and Tinian Military Lease Areas

To: Commander
Pacific Division
Naval Facilities Engineering Command
ENV183
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96860-3134

In response to your letter requesting written comments, dated 13APR04, NRCS Saipan Field Office submits the following comments:

1. For Tinian, page 1, line 10-16, the purpose of the INRMP is to identify natural resource issues, goals, and objectives, and proposes a 9 year natural resources management plan. Agriculture is mentioned briefly under Land Management, page 4, line 34. This is all based on an outdated 1997 NRMP and makes no mention of the effort underway for years on the part of the Tinian & Aguijan Soil and Water Conservation District (T&ASWCD) and the Natural Resources Conservation Service nor their efforts to utilize a part of the MLA for an agricultural park. The use of the MLA for a Tinian Agricultural Park is still a topic of major interest to the T&ASWCD Board Members.
2. Page 19, line 6, check spelling for *Casuarina equisetifolia*; it is misspelled.

Should you require further information concerning the Tinian Agricultural Park proposal, we would be happy to provide you with any information you may need for your INRMP.

Respectfully,

J. Scott Crockett
District Conservationist

cc: Joan B. Perry, Director, Pacific Basin Area; Charles B. Frear, Assistant Director, Pacific Basin Area; Ken Kramer, Soil Conservationist; Pamela Sablan, Soil Conservationist; Martin San Nicolas, T&ASWCD Chairman; Samson Palacios, T&ASWCD Coordinator

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HI 96860-3134

5090P.1G0B
Ser ENV1831/1226
15 JUL 2004

Mr. J. Scott Crockett, District Conservationist
United States Department of Agriculture
Natural Resources Conservation Service
Saipan Field Office
P.O. Box 5082 CHRB
Saipan, MP 96950

Dear Mr. Crockett:

Subj: AGENCY REVIEW OF THE DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR THE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP), FARALLON DE MEDINILLA AND TINIAN MILITARY LEASE AREAS (MLA), COMMONWEALTH OF THE NORTHERN MARIANAS ISLANDS

Thank you for participating in the agency review of the subject EA. This letter provides responses to your Natural Resources Conservation Service (NRCS) letter of May 6, 2004.

Comment 1: "For Tinian, page 1, line 10-16, the purpose of the INRMP is to identify natural resource issues, goals, and objectives, and proposes a 9 year natural resources management plan. Agriculture is mentioned briefly under Land Management, page 4, line 34. This is all based on an outdated 1997 NRMP and makes no mention of the effort underway for years on the part of the Tinian & Aguijan Soil and Water Conservation District (T&ASWCD) and the Natural Resources Conservation Service nor their efforts to utilize a part of the MLA for an agricultural park. The use of the MLA for a Tinian Agricultural Park is still a topic of major interest to the T&ASWCD Board Members."

Response: Agricultural activities are covered under a separate agricultural outleasing program and are not covered in the INRMP. The majority of the MLA leaseback area that is referred to in your comment, located north of Cross Island Road between Broadway and 8th Ave is encumbered as a conservation area set aside as mitigation for the West Field runway extension.

Comment 2: "Page 19, line 6, check spelling for *Casuarina equisetifolia*; it is misspelled."

Response: The spelling will be corrected in the Final EA.

The Navy appreciates NCRS's review of the EA for the INRMP. Our points of contact for the EA is Ms. Paulette Chang at (808) 472-1383 or via E-Mail at paulette.chang@navy.mil and for the INRMP is Mr. Timothy Sutterfield at (808) 472-1383 or via E-Mail at timothy.sutterfield@navy.mil or by facsimile transmission at (808) 474-5419.

Sincerely,

Melvin Z. Waki

MELVIN Z. WAKI, P.E.
Head
Environmental Engineering Department

Commonwealth of the Northern Mariana Islands
Office of the Governor
Department of Lands and Natural Resources
Lower Base
P.O. Box 10007
Saipan, Mariana Islands 96950

Cable Address:
Gov. NMI Saipan
Telephone: 322-9830/9834/9854
Fax: 322-2633

7-8-04

Commander
Pacific Division
Naval Facilities Engineering Command
ENV 183
258 Makalapa Drive, Suite 100
Pear Harbor, HI 96860-3134

Re: Draft Environmental Assessment for the Integrated Natural Resource Management Plan, Farallon De Medinilla and Tinian Military Lease Areas, Commonwealth of the Northern Mariana Islands

Dear Mr. Commander,

The CNMI Department of Lands and Natural Resources (DLNR) has review the April 2004 Draft Environmental Assessment (DEA) for the Integrated Natural Resources Management Plan (INRMP) for Farallon De Medinilla (FDM) and Tinian Military Lease Areas (MLAs) in the Commonwealth of the Northern Marianna Islands. The DEA and INRMP were both created by the Navy with extensive comments from DLNR and the US Fish and Wildlife Service (Service) in efforts to create a sound environmental management plan. The DLNR appreciates the efforts made by Robert Wescom and Ed Lynch CDR to explain the nature of the DEA and the INRMP and address the concerns of the DLNR.

The CNMI DLNR at this time concurs with the Finding of No Significant Impact (FONSI) determination for the implementation of the Proposed Action. There are however several issues that were communicated to Robert Wescom and Ed Lynch CDR that will be discussed before the Final Environmental Assessment is approved. The CNMI DLNR looks forward to frequent communication regarding these issues in creating a strong final INRMP and relationship with your office

Sincerely,

Richard B. Seman
Secretary DLNR

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HI 96860-3134

5090P.1G0B
Ser ENV1831/1225

15 JUL 2004

Mr. Richard B. Seman, Secretary
Department of Land and Natural Resources
Commonwealth of the Northern Marianas Islands
Lower Base
P.O. Box 10007
Saipan, Marianas Islands 96950

Dear Mr. Seman:

Subj: AGENCY CONCURRENCE AND REVIEW OF THE INTEGRATAED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) FARALLON DE MEDINILLA (FDM) AND TINIAN MILITARY LEASE AREAS THE ENVIRONMENTAL ASSESSMENT (EA) FOR THE INRMP FDM AND TINIAN MILITARY LEASE AREAS

Thank you for participating in the agency review and concurrence of the subject INRMP and EA. The Navy appreciates CNMI Department of Land and Natural Resource's participation and review of the INRMP and INRMP EA. We look forward to continuing our dialog of all our mutual interests in managing the natural resources of the Military Lease Areas on Farallon de Medinilla and Tinian.

If you have any additional questions or concerns, please contact Mr. Robert Wescom at (671) 339-2349, via E-Mail at n456@guam.navy.mil, Mr. Timothy Sutterfield at (808) 472-1383, via E-Mail at timothy.sutterfield@navy.mil or Ms. Paulette Chang at (808) 472-1383, via E-Mail at paulette.chang@navy.mil.

Sincerely,

MELVIN Z. WAKI, P.E.
Head
Environmental Engineering Department

Commonwealth of the Northern Mariana Islands
Coastal Resources Management
P.O. Box 10007, 2nd Floor, Morgen Building
San Jose Saipan, MP 96950

COASTAL RESOURCES MANAGEMENT

Tels.: (670) 6648300/14
Fax : (670) 664-8315

June 11, 2004

Commander
Pacific Division
Naval Facilities Engineering Command
ENV183
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96860-3134

Dear Commander:

The CNMI Coastal Resources Management Office (CRMO) has reviewed the *Draft Environmental Assessment for the Integrated Natural Resources Management Plan (INRMP) Farralon de Medinilla (FDM) and Tinian Military Lease Areas*. CRMO has no comments or concerns about the document. It appears to adequately address the coastal management issues of concern to CMRO. We understand that the CNMI Division of Fish and Wildlife (DFW) may have comments on the report; our comments do not speak for DFW.

Please let us know if you have any questions and thank you very much for your patience in waiting for our comments.

Sincerely,

Joaquin D. Salas
Director

Commonwealth of the Northern Mariana Islands
OFFICE OF THE GOVERNOR
Division of Environmental Quality
P.O. Box 501304 C.K., Saipan, MP 96950-1304
Tels.: (670) 664-8500 /01
Fax: (670) 664-8540

MAY 1 4 2004

Commander
Pacific Division
Naval Facilities Engineering Command
ENV 183
258 Makalapa Drive, Suite 100
Pearl Harbor HI 96860-3134

Subject: Comments to Draft Environmental Assessment (EA), Integrated Natural Resources Management Plan (INRMP), Farallon De Mendinilla (FDM) and Tinian Militrary Leas Areas.

Dear Commander:

The Commonwealth of the Northern Mariana Islands, Division of Environmental Quality, appreciates the opportunity to participate in the review of the above document.

As you may know, our agency's mission is to protect against any activity that may pose a threat to the environment and the public health. We implement both management and enforcement programs to ensure that such mission is met on a daily basis.

At this time we do not have any specific comments with respect to the intent of the EA, INRMP, for the MLAs in Tinian and FDM. We view the purpose of the EA as having beneficial gain in terms of the management of the natural resources of the subject MLAs within the Commonwealth. However, based on our review, we recommend that the EA adopt the Enhanced Alternative as it appears to offer more projects (Navy Level 1 and 2) that would promote the objectives of the INRMP.

Again, thank you for the opportunity to take part in this review and comment process.

Sincerely,

For John I. Castro, Jr.
Director

APPENDIX D

USFWS Biological Opinion (1-2-98-F-07), Military Training in the Marianas

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Boulevard, Room 3-122
Box 50088
Honolulu, Hawaii 96850

In Reply Refer To: 1-2-98-F-07 (LTG)

JAN - 4 1999

Mr. Fred Minato
Environmental Planning Division
Pacific Division, Naval Facilities Engineering Command
Building 258 Makalapa
Pearl Harbor, Hawaii 96860-7300

RE: Biological Opinion and Conference Report (Log Number 1-2-98-F-07), Military Training in the Marianas

Dear Mr. Minato:

This responds to your August 19, 1998, request for formal consultation under section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, Stat. 884), as amended (Act), relative to military (*i.e.*, Air Force, Navy, Guam National Guard, Army Reserve, and Marine Corps) training activities on the islands of Guam, Rota, Tinian, and Farallon de Medinilla in the Mariana Islands. The Department of Defense (DOD) is the action agency for this project. This document represents the Service's biological opinion (BO) on the effects of the proposed project on the endangered hawksbill sea turtle (*Eretmochelys imbricata*), Micronesian megapode (*Megapodius laperouse*), the threatened Tinian monarch (*Monarcha takatsukasae*) and green sea turtle (*Chelonia mydas*), and conference report on the effects of the proposed project on the proposed Mariana fruit bat (*Pteropus mariannus mariannus*) within the Commonwealth of the Northern Mariana Islands (CNMI) in accordance with section 7(a)(2) of the Act. Potential effects to the federally endangered Guam rail (*Rallus owstoni*), Mariana crow (*Corvus kubaryi*), Guam swiftlet (*Collocalia bartschi*), Mariana common moorhen (*Gallinula chloropus guami*), and Hayun lagu tree (*Serianthes nelsonii*) were also identified. However, the Service has concurred that the proposed military training activities are not likely to adversely affect these species.

Your August 19, 1998, request for formal consultation was received on August 21, 1998. This biological opinion and conference report is based on the following information: 1) the June 1998 draft environmental impact statement (DEIS) for Military Training in the Marianas; 2) previous biological opinions; 3) the biological literature (see References Cited section at the end of the document); and 4) other information sources. Our log number for this consultation is 1-2-98-F-07. Copies of pertinent materials and documentation are maintained in an administrative record in the Service's office in Honolulu, Hawaii.

Consultation History

The following are summaries of previous section 7 consultations regarding military training activities in the Mariana Islands applicable to the proposed action and a description of correspondence for the proposed action.

On May 2, 1984, the Service issued a BO (1-2-84-F-26) to the Navy addressing the potential impacts of "Kennel Bear" exercises on Tinian on federally listed species, including the Tinian monarch. These activities included unloading and loading of personnel, supplies, and equipment from C-130 aircraft, clearing of vegetation for establishing bivouac camps, setting up a perimeter defense around camps, and firing of weapons at the firing range. These activities were to occur twice each year for one to two weeks each time.

On July 17, 1984, the Service issued a BO (1-2-84-F-44) to the Navy addressing the potential impacts of Marine Corps exercises on Tinian on federally listed species, including the Tinian monarch. These activities included unloading and loading of personnel, supplies, and equipment from and on C-130 aircraft, establishing bivouac camps, firing of weapons at firing ranges, and tactical airdrops. The training involved approximately 400 persons and was to occurr approximately three times per year for four weeks each.

On July 25, 1989, the Service issued a BO (1-2-89-F-47) to the Navy addressing the potential impacts of helicopter training on Anderson Air Force Base, Guam. The federally listed species at issue was the Mariana crow.

On May 4, 1990, the Service issued a BO (1-2-90-F-003) to the Navy addressing the potential impacts of engineering field survey work needed prior to the construction and operation of the Relocatable Over-the-Horizon Radar Project P-225 on Guam (WESTPAC Finegayan) and in the northern portion of Tinian. The federally listed species at issue were the Tinian monarch, Mariana crow, and the Mariana fruit bat.

On August 15, 1990, the Service issued a BO (1-2-90-F-024) to the Navy for reinitiation of consultation for the construction of the P-223 radar transmitter facility on Tinian due to an increase in the number of acres of forest to be cleared. The federally listed species at issue was the Tinian monarch.

On June 22, 1992, the Service issued a BO (1-2-92-F-07) to the Navy addressing the potential impacts of VRC-50 flight squadron field carrier landing practice (FCLP) at Anderson Air Force Base, Guam. The federally listed species at issue were the Mariana crow and the Mariana fruit bat.

On July 30, 1993, the Service issued a BO (1-2-93-F-14) to the Navy addressing the potential impacts from the Navy's permanent relocation of the VRC-50 Squadron to Andersen and the need to conduct VRC-50 flight squadron field carrier land practice (FCLP) training missions. The federally listed species at issue were the Mariana crow and Mariana fruit bat.

On June 27, 1994, the Service issued a BO (1-2-94-F-05) to the Navy addressing the potential impacts of including aircraft training operations by carrier air wing CVW-5, at Anderson Air Force Base, Guam. The federally listed species at issue were the Mariana crow and the Mariana fruit bat.

On September 3, 1994, the Service issued a BO (1-2-94-F-06) to the Navy addressing the potential impacts of performing air operations, including field carrier landing practices (FCLPs) with aircraft from a transiting carrier air wing (CVW) at Andersen Air Force Base, Guam. The federally listed species at issue were the Mariana crow and the Mariana fruit bat.

On February 28, 1996, the Service responded to the DOD's Notice of Intent to prepare the Draft Environmental Impact Statement (DEIS) for Marianas Military Training Plan for the Territory of Guam and the Commonwealth of the Northern Marianas Islands (CNMI). In our response, we stated that the DEIS should describe endangered and threatened species, migratory fishes and birds, and rare, and native species to be affected by the proposed project, and assess the impacts to these species and identify appropriate mitigation measures, as well as address the possible introduction of the brown treesnake (*Boiga irregularis*) into the CNMI. We also recommended that section 7 consultation be initiated prior to issuance of the DEIS. The U.S. Pacific Command was identified as the lead agency for the proposed project and the Pacific Division, Naval Facilities Engineering Command as the coordinating agency.

On January 29, 1997, the Service issued a BO (1-2-97-F-01) to the Navy addressing the potential impacts of aerial bombardment and gunnery training over a four week period in February and/or March 1997 on Farallon de Medinilla (FDM). The federally listed species at issue were the Micronesian megapode, the green sea turtle, and the hawksbill sea turtle.

On April 16, 1997, the Service provided comments on the DEIS for Military Training in the Mariana Islands (January 1997 version) to the Department of the Interior (DOI). The Service recommended that a revised DEIS be prepared due to numerous deficiencies. In August 1998, the Service received the Revised DEIS for Military Training in the Marianas (June 1998 version) and provided comments to the DOI on September 21, 1998.

In an informal consultation dated May 2, 1997 with the U.S. Air Force, overflight conditions for activities at AAFB were negotiated in order to establish a not likely to adversely affect determination for the Mariana crow and Mariana fruit bat.

On May 16, 1997, the Service issued a BO (1-2-97-F-05) to the Navy addressing the potential impacts of gunnery training and aerial bombardment from July 21, 1997 to August 1, 1997, on FDM. The federally listed species at issue were the Micronesian megapode, green sea turtles, and hawksbill sea turtles.

On September 11, 1997, the Service issued a BO (1-2-97-F-08) to the Navy addressing the potential impacts of ship to shore gunnery practice during September 1997, on FDM. The federally listed species at issue were the Micronesian megapode, green sea turtle, and the hawksbill turtle.

On December 30, 1997, the Service issued a BO (1-2-98-02) to the Navy addressing aerial bombardment and small arms gunfire during January and February 1998 on FDM. The federally listed species at issue were the Micronesian megapode and the Mariana fruit bat.

On April 6, 1998, the Service issued a BO (1-2-98-03) to the Navy addressing aerial bombardment, naval gunfire, and small arms gunfire for the next three years on FDM. The federally listed species at issue were the Micronesian megapode and the proposed Mariana fruit bat.

On August 21, 1998, we received a request from the Department of the Navy on behalf of the Department of Defense to initiate section 7 consultation regarding Military Training in the Marianas. On October 2, 1998, the Service wrote a letter stating that the BO would be delivered on or before January 13, 1999 (should have stated January 2, 1999) and that all information required for the consultation was available.

BIOLOGICAL OPINION/ CONFERENCE REPORT

I. Description of the Proposed Action

A. Proposed Action

The following descriptions of the proposed military training actions are taken from the June 1998 Draft Environmental Impact Statement for Military Training in the Marianas and proposed action modifications and clarifications identified in Navy biologist Tim Sutterfield's October 1 and October 19, 1998 electronic mail messages to Assistant Field Supervisor Karen Rosa.

Guam

a) Waterfront Annex

The Waterfront Annex includes Orote Point and most of the shoreline of the Inner and Outer Harbors of Apra Harbor.

Ongoing or continuing activities at the Waterfront Annex include general field maneuvers, logistics support, aviation training, amphibious landing training, live fire

ranges, and underwater demolitions. Field maneuvers are defined as all general military training that occur on land, with the exception of live weapons fire and aviation-related activities. This includes tactical maneuvers on foot, travel in wheeled and tracked vehicles, use of signals and flares, clandestine raiders, rappelling, bivouacs, nuclear biological and chemical (NBC) training, and other miscellaneous activities. A training group for a field maneuver activity may consist of one to 2,000 individuals. Ongoing aviation training includes helicopter insertion and extraction, paradrops, firefighting bucket off loading, search and rescue, and cast and recovery training. Other ongoing training activities include amphibious landings of Landing Craft Air Cushions (LCAC), Landing Craft Utility (LCU), and Amphibian Assault Vehicles (AAV), riverine training, live fire ranges (*i.g.*, small arms known range, distance range, pistol range), and underwater demolitions.

Proposed or new training includes field maneuvers (stress course and rapid runway repair), aviation training, amphibious landing training, underwater demolition training, and live fire ranges. Proposed new aviation training includes forward area refueling near the small arms range and helicopter insertions and extractions in the North Tipalao rappelling area. Proposed new amphibious training includes LCAC landings at Tipalao, Dadi, and Toyland beaches; AAV landing sites at Sumay Cove Marina, the former WWII refueling pier, Tipalao, Toyland, Polaris Point, and Drydock Island beaches; and LCU landing sites at Sumay Cove Marina, the former WWII refueling pier, and Polaris Point and Toyland beaches. A new fire and maneuver range, skeet range, and shooting house is proposed for the southern section of Orote Point. One new deep-water underwater demolition training area is proposed offshore from Dadi Beach and three new shallow-water underwater demolition training sites are proposed (Tipalao, Spanish Steps, west tip of Outer Apra Harbor breakwater).

b) Ordnance Annex

The Ordnance Annex is located in the southern half of Guam and covers 36 square kilometers (sq km). Fena Reservoir, Guam's major surface water body, is located within Ordnance Annex.

Ongoing or continuing activities include field maneuvers, logistics support, and aviation training. Field maneuvers and logistics support training involve water purification, land navigation, small unit reconnaissance patrolling, command post exercises, and bivouac (small to medium). Ongoing aviation training involves using existing helicopter landing zones to land and recover embarked personnel and equipment, personnel insertions and extractions, simulated Tactical Recovery of Aircraft and Personnel (TRAP) and Close Air Support (CAS) in areas north of the ammunition storage area, and using Fena Reservoir to train helicopter crews to load an external fire bucket.

New proposed training activities include paradrops and live firing ranges. Proposed paradrops will use an existing drop zone for small groups of troops delivered from helicopters. A new range area that contains a sniper range, breaching house, jungle trail range, and one SDZ is proposed for the entire southern portion of the Ordination Annex.

c) Andersen Air Force Base and Communication Annexes

Andersen Air Force Base (AAFB), Andersen South, and the two Communication Annexes (*i.e.*, Barrigada and Finegayan) comprise 92 sq km. A National Wildlife Refuge Overlay has been established over much of northwest AAFB and an Ecological Reserve Area has been established at the Communications-Annex Finegayan, including Haputo Beach.

Ongoing training activities include the continued use of the area for field maneuvers, aviation training, Explosive Ordnance Disposal (EOD) demolition, and live fire training.

The proposed new training activities involve the rapid runway repair to be conducted on a former taxiway of Northwest Field, fire bucket off loads in the Main Base area, and the use of mortars (training rounds) at the small arms range at AAFB's Tarague Beach.

Non-DOD Lands

a) Guam

The continuing activity involves the Army National Guard conducting parachute jumps at the Casper and Ghost Drop Zones, near NASA Road in Talofofo on private land in Dandan. This training is conducted bimonthly in small units (typical training unit of 24 personnel).

b) Rota

Continuing activities on Rota include the use of a small island in Songsong Harbor for a small forward staging base for approximately 7 days per month.

Tinian

The action area for military training activities (proposed and ongoing) on Tinian occurs within the Military Lease Area (MLA) and a portion of the southern one-third of Tinian. The MLA consists of the northern two-thirds of the island of Tinian. On the southern one-third of the island troops are brought into the MLA via West Tinian Airport or San Jose Harbor. Troops brought in at the airport and harbor will conduct a "movement to contact" by tactically moving north to the MLA by vehicle or by foot.

Ongoing or continuing training activities considered on Tinian include large-scale maneuvers (airfield seizure/defense and bivouacs), a variety of aviation training, and LCAC training. Ongoing aviation training includes airmobile training (airmobile landings, C-130 cargo drops), airborne training (paradrops), helicopter insertion and extraction, night vision goggle training, fighter and attack aircraft training, firefighting and forward area refueling. Ongoing amphibious landing training on Tinian includes LCAC training at Unai Chulu and Unai Dankulo beaches and LCU landings at Kammer Beach.

Proposed new activities include constructing a small logistics support base camp and new amphibious training. The new camp will be located on the eastern edge of the VOA. New amphibious landings proposed are AAV landings at Kammer and Unai Babui beaches.

After the receipt of the DEIS, several changes and clarifications concerning the training activities on Tinian were made by biologist Tim Sutterfield in his October 1 and October 19, 1998, electronic mail messages to the Service, including:

1) The fire and maneuver range was deleted from the preferred alternative;

2) The only beaches to be used for LCAC landings are Unai Chulu and Unai Dankulo beaches; Tachagna Beach will not be used;

3) No clearing of vegetation is proposed for training areas and bivouac areas; and

4) The only vegetation to be cleared is for the logistic support facility that will be located in the boundary of the VOA site and will require the clearing of 0.75 acres of grassland.

Farallon de Medinilla (FDM)
All of the military training activities on FDM were reviewed in the Service's April 6, 1998, BO (1-2-98-F-03). No new military activities for FDM are proposed in the DEIS that were not covered in this previous BO (Tim Sutterfield, personal communication 1998).

B. Actions to minimize threats to endangered and listed species

1. Brown Treesnake Control/Interdiction Plan (BTS Plan) for Military Training Exercises

Included within the DEIS is a description of the measures to be implemented by DOD to minimize the threat of further dispersal of the brown treesnake (BTS) in the Pacific due to military activities. These measures are described in the BTS Plan in Appendix E of the DEIS.

Specific measures identified in the BTS Plan are as follows:

a) The USDA Wildlife Services (WS) office on Guam is the primary agent for BTS control for the military and is responsible for the following:

   1) Inspection of military cargo staged at AAFB and in Apra Harbor on Guam for BTS;
   2) Maintenance of trapping and night searches at high-risk areas, airfields, and ports whether training occurs or not;
   3) Providing personnel, traps, lights, bait, and guidance for military training exercises on Tinian;
   4) Establishing quarantine procedures on Tinian in coordination with local wildlife and/or customs officials and performing inspections of all arriving cargo, in coordination with the CNMI Department of Fish and Wildlife. Quarantine activities required at all ports of entry include erecting temporary barriers, establishing sterile areas, and activating snake traps.
   5) Delegation of manpower and dogs construct cargo containment areas (snake proof enclosures or exclosures); and
   6) Providing additional information and assistance as needed.

b) Military aircraft will not be able to take off from Guam without having been properly inspected by WS;

c) All training personnel arriving on Guam for an military training exercise will be provided with an BTS information packet and briefed on the BTS hazard prior to leaving Guam for Tinian or Rota;

d) Any person sighting a BTS should attempt to kill or trap the snake and report the incident immediately to WS officials;

e) For all exercises involving interisland transport, COMNAVMARIANAS or AAFB environmental personnel will advise WS in as many days in advance as possible;

f) COMNAVMARIANAS will monitor compliance with the BTS Plan by coordinating with WS and base environmental personnel on at least a quarterly basis to keep abreast of lessons learned and new problem solving techniques.

2. Mitigation for amphibious vehicle landings on turtle nesting beaches:
   a) Prior to beach landings by amphibious vehicles, known turtle nesting

beaches will be surveyed by a Navy biologist for the presence of sea turtle nests no more than six hours prior to a landing;

b) Areas free of nests will be flagged, and vehicles will be directed to remain within these areas;

c) A Navy biologist will monitor beaches during any nocturnal landings.

d) If any sea turtles are observed or known to be in the area, training will be discontinued until all nests have been located and turtles have left the area;

e) LCAC landings on Tinian will occur during high tide, LCAC's must maintain a full cushion until they reach the top of the beach (off of the sand), and complete the initial 180 degree turn prior to coming off full cushion;

f) On Tinian surveys will be conducted before and after each LCAC landing and AAV landing at least two times per year at Unai Chulu and Unai Babui with Unai Lamlam surveyed as a control site. Navy contracted surveyors will record percent coral cover, turbidity, fish assemblage, sedimentation rates, and the topography of the site;

g) AAV landings at Unai Babui will be restricted to an established approach lane and allowed to land only during high tide and in single file.

3. Overflight conditions over AAFB to minimize impacts to the Mariana crow and Mariana fruit bat.

a) No overflights below 1,600 feet Above Mean Sea Level (MSL) are allowed over Munitions Storage Area 1.

b) For the rest of Andersen AFB, overflights would be allowed below the 1,600 foot MSL during the three- month crow non-breeding season (June through August).

c) No overflights are allowed below 1,600 foot MSL directly above crow territories during the nine-month crow breeding season (September through May). Crow territories will be determined by consultation with the Guam Division of Aquatic and Wildlife Resources.

d) Helicopters are to remain ½ nautical mile from the perimeter of the bat colony at Pati Point, with the exception of flights originating from the end of runways (similar to fixed wing aircraft operations).

4. Areas designated as "No wildlife disturbance"
Within a "no wildlife disturbance" area, the following activities are prohibited:

a) Off-road vehicular traffic;

b) Pyrotechnics or open fires;

c) Firing blanks;

d) Live ammunition or training demolition;

e) Digging;

f) Mechanical vegetation clearing;

g) Flights below 305 meters (m) (1,000 feet) AGL: and

h) Helicopter landing zones.

5. Areas designated as "No training"
Within a "no training" area, no training is allowed, except troop and vehicle movement along established roads to protect wetlands and other rare habitats.

II. Biology and Population Status of the Species

A. Species Not Likely to Be Adversely Affected

The following are summaries of the species considered by the Service during the consultation period for which no adverse effects are anticipated:

Guam rail (*Rallus owstoni*)

Guam rails have been reintroduced to Area 50, AAFB, Guam. Area 50 has been fenced and is in the process of having brown treesnakes removed from the site. The Service does not anticipate that military training activities within AAFB are likely to adversely affect the Guam rail.

Mariana fruit bat (*Pteropus mariannus mariannus*)

Fruit bats are known to forage within the Ordnance Annex on Guam. Military training activities within the sniper range could cause fruit bats foraging in the area to disperse to other areas of Guam. The Service does not anticipate that these activities are likely to adversely affect the Mariana fruit bat on Guam.

Mariana Crow (*Corvus kubaryi*)

In a July 1996 report issued by the Service to the Navy entitled *The Effects of Aircraft Overflights on Endangered Mariana Crows and Mariana Fruit Bats at Andersen Air Force Base, Guam*, the Service documented that low altitude aircraft flights (< 183 meters (m) [600 foot (ft)] Above Ground Level (AGL)) can elicit distress, cause crows to flush, and disrupt nest building, incubation, and nest attendance at least temporarily. Mariana crows also maintain year-round territories and are very susceptible to disturbance during the nest tree selection process immediately prior to the breeding season. The pre-nest building phase of the breeding season is critical for successful breeding and is generally categorized by behaviors such as increased vocalizations, allopreening, and carrying and offering sticks. Disturbance during this critical phase could preclude breeding altogether.

In an informal consultation (May 2, 1997) with the U.S. Air Force, overflight conditions for activities at AAFB were negotiated in order to establish a not likely to adversely affect determination for the Mariana crow. Overflight conditions over Andersen AFB are as follows: (1) no overflights below 487 m (1,600 ft) Above Mean Sea Level (MSL) are allowed over Munitions Storage Area 1, (2) for the rest of Andersen AFB, overflights would be allowed below the 487 m (1,600 ft) MSL during the three- month crow non-breeding season (June through August), and (3) no overflights are allowed below 487 m (1,600 ft) MSL directly above crow territories during the nine-month crow breeding season (September through May). Crow territories will be determined by consultation with the Guam Division of Aquatic and Wildlife Resources.

Guam Swiftlet (*Collocalia bartschi*)

The Guam swiftlet is endemic to the Mariana Islands of Guam, Aguiguan, and Saipan and is the only resident swift in the Mariana Islands. Guam swiftlets seem to prefer to forage above forested ridges and open grassy areas, but they forage over a wide variety of terrain and vegetation and they roost and nest in caves (Pratt *et al.* 1987, USFWS 1991). Caves are occupied throughout the year (USFWS 1991).

Guam swiftlets are found in Mahlac and Fachi Caves, and have been observed foraging along Fena Valley Reservoir and Sadog Gago River (J. Morton, USFWS, personal communication 1998), all of which are located within the Ordnance Annex on Guam. Mahlac Cave harbors what is estimated to be 90% of all swiftlets on Guam, housing between 280-300 birds (USFWS 1991). It is the only significant breeding colony that remains on Guam. Fachi Cave, located within an ammunition bunker, harbors an estimated 15-25 swiftlets (J. Morton, USFWS, personal communication 1998). Military training is not allowed within the area of these two caves. The only public access being considered for Mahlac Cave by the Navy is a recreational fishing program initiated on August 3, 1996, at Fena Lake. It is not likely that this fishing program will lead to more visitors to Mahlac Cave, due to the close supervision of the public and the distance of the lake from Mahlac Cave (L. Morton, Natural Resources Manager, Naval Activities, Guam, personal communication 1996). It is also important that the name of the cave be omitted from any published reports, as the name may serve as a locational guide to persons familiar with the location of Mahlac Stream, which flows through the east side of the Navy base near the cave. The Navy has previously agreed to omit locational information (Biological Opinion 1-2-96-F-06).

Military training activities within the sniper range (Ordnance Annex) would likely cause swiftlets foraging within the lower portion of Fena Valley Reservoir or along Sadog Gago River to disperse to other foraging grounds. Therefore, the Service has determined that the proposed project is not likely to adversely affect the Guam swiftlet.

Mariana Common Moorhen (*Gallinula chloropus guami*)

Moorhens in the Mariana Islands are found primarily at freshwater human-made and natural wetlands that are both seasonal and permanent. Occasionally, they are recorded in brackish water wetlands. The current total estimated population of Mariana common moorhens in the Mariana Islands is approximately 300 to 400 birds (USFWS 1996a). Within the action area, Lake Hagoi, Mahalang, and Bateha Wetlands on Tinian and four wetlands each within the Ordnance Annex and the Waterfront Annex on Guam support moorhens. Lake Hagoi supports approximately 40 birds (USFWS 1996a) and is designated as a "no training" area by the military. The only military training activities allowed within a "no training" area are troop and vehicle movements along established roads. It is anticipated that military training will not affect moorhens using Lake Hagoi. Mahalang and Bateha Wetlands are estimated to support no more than 10 moorhens (USFWS 1996a). Military training activities near these wetlands would likely cause moorhen to temporarily disperse to other wetlands.

Riverine training in Atantano River (Waterfront Annex) is expected to occur seven days a month and involve 16-20 people. The area surrounding the proposed training area is a mangrove swamp and is known to occasionally support moorhen (M. Ritter, USFWS, personal communication 1998). The mangrove swamp is designated as a "no training" area; however, it is anticipated that military training activities in the Atantano River could cause moorhen using the mangrove swamp to disperse to another wetland. There is no military training proposed or ongoing that will affect the other three wetlands known to support moorhen within the Waterfront Annex.

There are four wetlands within the Ordnance Annex that provide habitat for the moorhen. Two seasonal wetlands are located within a "no training" area and the majority of Fena Reservoir is within a "no wildlife disturbance area." A "no wildlife disturbance" designation is described as an area in which the following are prohibited: off-road vehicular travel, pyrotechnics, demolition, digging, mechanical vegetation clearing, flights below 305 m (1,000 ft) AGL, and helicopter landing zones. Heliborne firebucket (onload) and combat swimmer training occur within the northern portion of Fena Valley Reservoir, which is not known to support moorhen. There are no proposed or ongoing military training exercises affecting the fourth wetland within the Ordnance Annex. It is anticipated that no moorhens within the Ordnance Annex will be affected by ongoing or proposed military training activities. However, it is anticipated that military activities in Atantano River on Guam and near Mahalang and Batcha Wetlands on Tinian could cause moorhens using the wetlands to temporarily disperse to another part of the wetland or another wetland. It has been determined that the proposed training exercises are not likely to adversely affect the Mariana moorhen:

Serianthes nelsonii

Two populations of *Serianthes nelsonii* are known from Rota and Guam. All remaining individuals of *Serianthes nelsonii* occur in native limestone forest on soils derived from limestone substrates, with most trees growing on or near steep hillsides or cliffs. However, the species formerly inhabited sites with volcanic soils in southern Guam (USFWS 1993). There were 122 individual plants known in 1993 (USFWS 1993). Currently, there is one mature tree remaining on Guam on Anderson Air Force Base on top of the sea cliffs at Ritidian Point and three seedlings persist on Northwest Field in the vicinity of the tree that was destroyed in 1992 during Typhoon Omar (G. Hughes, USFWS, personal communication 1998; Wiles *et al.* 1995). The mature tree is enclosed within a 3,048 square m (10,000 square ft) fence and the three seedlings are contained within a protective cage to prevent browsing by ungulates. Another 121 individuals are scattered along the Sabana cliffs on Rota, primarily above the town of Songsong. However, this population does not occur within an area of ongoing or proposed military activities. The Service has determined that the proposed project is not likely to adversely affect populations of *Serianthes nelsonii* due to the fencing that protects the mature plant on Guam from training activities and the fact that the plants on Rota do not occur within the action area.

B. Species Likely to be Adversely Affected

Green Sea Turtle (*Chelonia mydas*)

The green sea turtle was listed as a threatened species on July 28, 1978. Green sea turtles are distributed globally throughout tropical and subtropical seas with temperatures above 20 degrees Centigrade (National Marine Fisheries Service [NMFS] 1998a), and are known to occur in the waters of the CNMI (USFWS 1996b).

Green sea turtle hatchlings average 4.7 to 5.4 centimeters (cm) (1.9 to 2.2 inches [in]) in carapace length and weigh between 22 to 31 grams (gm) (0.8 to 1.1 ounces [oz]) and can grow to more than one meter in carapace length and weigh over 100 kilograms (kg) (220 pounds [lbs]) (NMFS 1998a). The color of the green sea turtle's carapace changes as it grows from a hatchling to an adult. The dorsal side of hatchlings is black and the ventral side is pure white (NMFS 1998a). Juveniles are between 35-65 cm (14-26 in) in length have a streaked or radiating sunburst of patterns of yellowish-gold, olive, light and dark brown, reddish-brown, and black (NMFS 1998a). The color of an adult carapace varies from light to dark brown, sometimes shaded with olive, with radiating wavy or mottled markings of a darker color or with large blotches of dark brown (NMFS 1998a).

Green sea turtles greater than 30-35 cm (12-14 in) feed exclusively on macroalgae and seagrasses, while post-hatchlings and juveniles feed carnivorously (*e.g.*, invertebrates and fish eggs) (NMFS 1998a).

Wild green sea turtles have exhibited slow growth and delayed sexual maturity (NMFS 1998a). Studies have estimated that the average age for sexual maturity is at least 25 years (NMFS 1998a). Green sea turtles have been documented to migrate long distances, over 1,000 kilometers (km) (600 miles), between foraging grounds and nesting beaches (NMFS 1998a). For example, a turtle tagged on Tinian was recently sighted in the Philippines (George Balazs, NMFS, personal communication 1997). After completing migration to nesting beaches, green sea turtles lay several successive clutches of eggs during the nesting season before returning to the foraging grounds. On average the green sea turtle lays 1.8 clutches of eggs per season or up to 6 clutches. Each clutch is laid at 10 to 15 day intervals and contains approximately 100 eggs per clutch. Eggs incubate in the sand for 54 to 88 days (mean of 64.5 days). Green sea turtles are known to nest in the CNMI from January through August, which means hatching may continue into October (USFWS 1996b). Female green sea turtles migrate to breed only once every two or possibly more years.

There are no population estimates for the CNMI populations of green sea turtles, but there are some records available. In 1995, six to ten turtles were recorded nesting on the island of Tinian and a similar number probably nested there in 1994 (USFWS 1996). This implies that the nesting population in the CNMI is not very large presently, but at one time may have been much larger (USFWS 1996). Fewer than ten green turtles nest on the islands of Saipan, Tinian, and Rota each year (NMFS 1998a). Turtles are also known to nest on FDM and Guam (G. Davis, Guam Department of Wildlife Resources, personal communication 1998).

The green sea turtle was listed due to its declining numbers associated with overexploitation for commercial and other purposes, habitat loss and degradation. Populations of the green sea turtle in the Pacific region have continued to decline due to directed harvest (both illegal and legal) and negative impacts to essential habitats (NMFS 1998a). Spread of fibropapilloma has also slowed the recovery of green sea turtle populations (NMFS 1998a).

Green sea turtles are known to nest on the beaches of Tinian and FDM. Amphibious landing training on several beaches of Tinian and bombing activities on FDM are likely to adversely affect the green sea turtle.

Hawksbill Sea Turtle (*Eretmochelys imbricata*)

Hawksbills are usually less than 95 cm (38 in) in carapace length, which is considered relatively small. They have a narrow head with a tapering beak, thick, overlapping shell scutes, and strongly serrated posterior margin of the carapace (NMFS 1998b). Hatchlings of the hawksbills average 13.2 gm (0.5 oz) and have a tan-colored carapace, top of the head and neck, while the sides and bottom of the head and neck (including the beak) are dark grey; the dorsal and ventral sides of the fore flippers are grey with a whitish fringe around the posterior edge; the dorsal and ventral sides of the hind flippers and plastron are dark grey with two whitish ridges posteriorly on the plastron (NMFS 1998b). Juvenile hawksbill

turtles vary in color; the carapace ranges from light brown to black with varying amounts of distinct yellow streaks and blotches (NMFS 1998b). The adult has a carapace that is dark brown with faint yellow streaks and blotches; the scales on the dorsal side of the flippers and head are dark brown to black with yellow margins; the ventral side of the flippers and the plastron are pale yellow, with scattered dark scales on the flippers (NMFS 1998b).

The hawksbill sea turtle was listed as an endangered species on June 2, 1970. Hawksbill sea turtles occur globally, generally occurring between 30 degrees north and 30 degrees south latitudes in the Atlantic, Pacific, and Indian oceans and associated bodies of water (NMFS 1998b), and are known to occur in the waters of the CNMI (USFWS 1996). Hawksbill sea turtles appear to feed exclusively on sponges (NMFS 1998b).

Hawksbill sea turtles have been documented to migrate long distances, over 1,000 km (600 miles), between foraging grounds and nesting beaches (NMFS 1998b). Hawksbill turtles lay several successive clutches of eggs during the nesting season before returning to the foraging grounds. The hawksbill turtle lays between three to six clutches per season. There is a 13- to 19-day interval between consecutive clutches with approximately 100 eggs per clutch. Eggs incubate for approximately 60 days. The size of a clutch and the days of incubation vary from nest to nest, and site to site. There is no information available regarding the exact month(s) hawksbills nest in the CNMI or Guam. In other areas of the world, hawksbill sea turtles have been recorded nesting year-round (NMFS 1998b).

There are no population estimates for hawksbill sea turtles in the CNMI and Guam, and there is little evidence that hawksbill turtles nest within the CNMI and Guam. However, this does not rule out that they are nesting at low levels at unknown locations (NMFS 1998b). Although no hawksbill turtles were observed nesting on Tinian in 1995, there have been a few reports of hawksbills nesting on Rota and Saipan within the CNMI and on Guam (USFWS 1996).

Hawksbill turtles in the Pacific Islands have dramatically declined. The most serious threat is the harvesting of turtles on nesting beaches and in coastal waters by humans (NMFS 1998b). Other threats to hawksbills in the Pacific include habitat loss due to expansion of resident human populations and/or increased tourism development, and the incidental take of turtles in distant-water fisheries (NMFS 1998b).

Hawksbill sea turtles are known to nest within the action area on Guam. Amphibious landing exercises on Guam are likely to adversely affect the hawksbill sea turtle.

Mariana fruit bat (*Pteropus mariannus mariannus*)

The Mariana fruit bat, locally known as *fanihi*, is a medium-sized fruit bat in the family Pteropididae. This subspecies is restricted to the Mariana archipelago, comprised of the

Territory of Guam and the CNMI. These bats weigh between 330 to 577 gm (0.66 to 1.15 lbs) and have a forearm length ranging from 13.4 to 15.6 cm (5.3 to 6.1 in); males are slightly larger than females (USFWS 1998a). The underside (abdomen) is colored black to brown, with gray hair interspersed, creating a grizzled appearance. The shoulders (mantel) and sides of the neck are usually bright golden brown, but may be paler in some individuals. The head varies from brown to dark brown. The well-formed and rounded ears and large eyes give a canine-like appearance giving rise to the nickname "flying foxes."

The Mariana fruit bat on Guam was listed as endangered on August 27, 1984, without critical habitat (49 FR 33881). On March 26, 1998, the Service proposed to downlist the Mariana fruit bat on Guam to threatened status, and designate all Mariana fruit bats in the Mariana archipelago as threatened (63 FR 14641). Should the proposed rule go final, the fruit bats on Guam, which are currently listed as endangered, will be downlisted to threatened and all of the fruit bats in the Marianas archipelago will be protected as a threatened species.

The Mariana fruit bat is highly colonial, forming colonies of a few to over 800 animals (Pierson and Rainey 1992, Wiles 1987a, Worthington and Taisacan 1995). The bats group themselves into harems (one male and two to 15 females) or bachelor groups (predominately males), or reside as single males on the edge of the colony (Wiles 1987a). Reproduction is believed to occur throughout the year on Guam, with no apparent peak in births (Wiles 1987a). Female bats of this family generally have one young per year, resulting in a slow recovery rate when populations are reduced in numbers (Pierson and Rainey 1992). Length of gestation and age of sexual maturity are unknown for the Mariana fruit bat, but other related bats have a gestation period of approximately 4.6 to 6.3 months (Pierson and Rainey 1992). Female Mariana fruit bats on Guam may be able to breed as soon as at 6 to 18 months of age (USFWS 1990b), but sexual maturity in Pteropodid bats usually does not occur until the bats are 18 to 24 months old (Pierson and Rainey 1992).

Native forest is the primary habitat required by the Mariana fruit bat, although some introduced plant species can provide roosting and feeding resources. Fruit bats are important in tropical forests because they naturally disperse plant seeds and thereby help maintain forest diversity and contribute to plant recovery after typhoons and other catastrophic events (Cox *et al.* 1992). Mariana fruit bats forage and roost primarily in native forest, and occasionally in coconut groves and strand vegetation (Wiles 1987b, Worthington and Taisacan 1996). At least 22 plant species are used as food sources by the Mariana fruit bat, including fruits of 17 species of plants, the flowers of seven, and leaf stems and twig tips of *Artocarpus* spp. (USFWS 1990b, Wiles 1987a).

Although the status of the Mariana fruit bat prior to the 20th century is unknown, it likely occurred throughout the Mariana Islands and was probably common on the larger southern islands in the archipelago. Currently, there are estimated to be between 200 and 750 animals on Guam (Wiles 1996, Wiles *et al.* 1995), 25 to 125 animals on each of the islands of

Aguiguan, Saipan, and Tinian (Lemke 1984, Marshall *et al.* 1995b, Wiles 1996, Worthington and Taisacan 1996), 1,000 on Rota (Worthington and Taisacan 1996), and a minimum of 7,450 bats on the smaller islands north of Saipan (Anonymous 1984, Wiles *et al.* 1989). Bats may be uncommon on some of the smaller islands such as Maug, Uracas, and FDM, but are known to occur on all of them (USFWS 1998a). Based on these figures, the total population for the Mariana Islands is estimated to be at least 8,725 animals, although this figure is based on rough estimates from the northern Mariana Islands. Evidence indicates that bats move regularly between the larger southern islands and at least annually between the more remote northern islands (Wiles and Glass 1990, Wiles *et al.* 1989, Worthington and Taisacan 1996).

Fruit bat populations on Guam have been reduced possibly due to poaching, particularly since the introduction of firearms (Coultas 1931), and predation by the brown tree snake (Wiles 1996, Wiles *et al.* 1995). Loss of habitat through the effects of typhoons, development projects, and the introduction of feral rats, pigs, and goats has also contributed to the decline of this species throughout the Marianas (Kessler 1997, Marshall *et al.* 1995, USFWS 1998). Throughout both the inhabited southern and uninhabited northern islands, poaching continues to be one of the most important factors in the decline of the Mariana fruit bat (Glass and Taisacan 1988, Lemke 1992, Marshall *et al.* 1995b, USFWS 1990b, USFWS 1998a, Worthington and Taisacan 1996).

Fruit bats are known to occur within the action area. Aerial bombardment, gunnery training, naval gunfire, and small arms gunfire exercises conducted on FDM are likely to adversely affect the Mariana fruit bat.

Micronesian megapode (*Megapodius laperouse*)

The Micronesian megapode (known locally as *sasangat* or *sasangal*) is a pigeon-sized bird with dark gray-brown to black body plumage, an ash-gray head with a slightly darker, short, rough crest, a yellow bill, very sparse or absent feathers around the eye, ear, and throat revealing red skin and a red throat patch, and heavily built yellow legs and feet (Baker 1951, Pratt *et al.* 1987, USFWS 1998b). The U.S. Fish and Wildlife Service (Service) listed the Micronesian megapode as endangered in 1970 (35 FR 8491-8498). Two subspecies of the Micronesian megapode are found in Micronesia, *M. l. laperouse* in the Mariana Archipelago, and *M. l. senex* in Palau (USFWS 1998b). Critical habitat has not been designated for this species.

The Megapodiidae are part of a family within the order Galliformes (chicken-like birds) found only in the Australasian region. The family comprises seven genera found in Australasia, Australia, New Guinea and surrounding islands, eastern Indonesia, the Nicobar Islands, the Philippines, Micronesia, Vanuatu, and Niuafo'ou of the Tonga Islands (USFWS 1998b). Megapodes are ground-dwelling birds, but, in spite of their terrestrial habits, megapodes fly well and apparently cross large bodies of water easily (Olson 1980, Pratt *et*

al. 1980).

The Micronesian megapode is generally a bird of the forest. On the southern Mariana Islands they are primarily restricted to native limestone forest (USFWS 1998b). On Sarigan, megapodes are often seen in coconut forest as well as native vegetation, and on Guguan and Maug megapodes seem to prefer forest but are also seen in scrubby and even barren areas (USFWS 1998b). Megapodes encountered in fields of grass and vines are mostly juveniles rather than territorial pairs, suggesting that this is less preferred habitat (Glass and Aldan 1988, Rice and Stinson 1992). The Micronesian megapode seems to be an omnivore taking a variety of plant and animal foods available on the forest floor, including seeds, beetles, ants, other insects, and plant matter (Baker 1951, Glass and Aldan 1988, Stinson 1993a).

Megapodes are sometimes called "incubator birds" because they rely on solar energy, volcanic activity, or microbial decomposition as a heat source for incubation (Clark 1964). They are also characterized by laying large eggs without an air chamber and chicks that lack an egg tooth at hatching and kick their way out of the egg (Clark 1964, Dekker and Brom 1992). Megapode chicks are precocial (feathered, able to walk, and able to regulate their body temperature) at hatching and the adults do not care for the young (Jones *et al.* 1995). There is no information on the number of eggs laid per season by the Micronesian megapode (USFWS 1998b). Apparently one egg is laid at a time but the interval between egg laying is unknown (USFWS 1998). Nicobar megapodes (*M. nicobariensis abbotti*) have an interval of nine days between each egg that is layed (Dekker 1992) while the laying interval is 9 to 20 days (average 13 ± 4 days) for the orange-footed megapode (*M. reinwardt*) (Crome and Brown 1979). The Polynesian megapode (*M. pritchardii*) may lay 10 to 12 eggs per year (Todd 1983) and one orange-footed megapode laid 12 or 13 eggs over a 4.5-month breeding season (Crome and Brown 1979).

Micronesian megapodes are known to give at least three types of calls, including two calls that are different for males and females and that may be given in a duet. Duetting in birds is correlated with year-round territorial behavior and life-long pair bonds. The existence of duetting in the Micronesian megapode supports the report of Glass and Aldan (1988) that on Saipan megapodes seem to remain together throughout the year in territories that are advertised and defended at least part of the year. It is not known how, or if, territoriality functions at or near heavily used communal nesting areas like the one on Guguan (USFWS 1998b). Seasonality in vocalizations, particularly duetting, is believed to be indicative of seasonal changes in breeding activity, but no clear pattern has thus far emerged for the Micronesian megapode (USFWS 1998b). Chicks were reported to leave nests from January or February to June (Oustalet 1896). Chicks of all sizes have been seen in May and June on Guguan (Glass and Aldan 1988, Rice and Stinson 1992; R.B. Clapp *in litt.* 1983) and in September on Sarigan (Rice *et al.* 1990). Megapodes have been observed digging nest burrows on Maug in late March and early June and on Guguan in May, August, and September (Glass and Villagomez 1986, Reichel *et al.* 1988, Rice and Stinson 1992).

Nesting on some islands may occur year-round and breeding seasonality may differ between islands depending on the source of heat for incubation (USFWS 1998b). There is no information on the nesting success or the age of sexual maturity for the Micronesian megapode.

The Micronesian megapode was historically widespread throughout the Mariana Island chain and has been recorded on all the islands, with the possible exception of Uracus (USFWS 1998b). But numbers declined on all of the southern Mariana Islands (Guam, Rota, Aguiguan, Tinian, and Saipan) in the 19th and early 20th centuries. It is doubtful if the species has ever been abundant during the last century. Definitive population surveys have not been undertaken, but observations indicate that the bird exists in small, but relatively stable, numbers, particularly on the northern islands. The megapode was extirpated on Guam and Rota, and small, remnant populations persist on Aguiguan and Tinian (fewer than 10), along with a very small (possibly reintroduced) population on Saipan (10-25 birds). Megapodes have been consistently found in small numbers (10-15) on Aguiguan during this century (Craig *et al.* 1992, Engbring *et al.* 1986, Lusk 1993, Owen 1974, Stinson 1993a, Takatsukasa 1932-1938, USFWS 1998b). A total of four megapodes were observed on Farallon de Medinilla in November 1996 (Lusk and Kessler 1996). The total island population is estimated to be less than ten birds (USFWS 1998b). The megapode remains in relatively large numbers only on the smaller, mostly uninhabited northern islands. Megapodes were not recorded on Anatahan until 1971 (Falanruw 1975) but current estimates are 200-300 birds (Reichel and Glass 1988a, USFWS 1998b). A recent forest bird survey on Sarigan estimated the population at 545-810 birds (Fancy *et al.* In review). Guguan probably supports the largest megapode population in the Marianas of around 500 birds (Rice and Stinson 1992). Megapode numbers on Guguan are believed to have declined for unknown reasons since estimates were made in 1986 of 1,200 to 2,200 birds (Glass and Villagomez 1986, USFWS 1998b). Fewer than 30 birds are reported on Alamagan, 50 to 100 on Pagan, an unknown number on Agrihan, fewer than 25 on Asuncion, 50 to 100 on Maug (on three islands), and none on Uracus (USFWS 1998b).

Current population estimates of the megapode total about 1,440 to 1,975 birds in the island chain (USFWS 1998b). The megapode was listed as endangered due to historical extirpations on Guam, Rota, Tinian, and possibly Saipan. The decline in numbers is thought to have resulted from intense exploitation by humans (hunting of adults and collection of eggs) and habitat loss (USFWS 1998b). Agriculture and overgrazing by feral goats, cattle and pigs have had a profound effect on the vegetation of the islands and are of concern for megapode (and other native forest species) populations in the northern islands (USFWS 1998b). Loss of habitat through volcanism is also known to have caused serious declines (USFWS 1998b). In addition to possible direct human predation, megapodes are known to be preyed upon by introduced monitor lizards and may also be preyed upon by feral dogs, cats, and pigs (Dekker 1989, Ludwig 1979).

A serious potential threat to megapode populations is the establishment of the brown treesnake from Guam to other islands in the Marianas archipelago (USFWS 1998b). The brown treesnake was accidentally introduced to Guam shortly after World War II and has systematically spread throughout the island, causing the loss of nearly all of the avifauna (birds) and many of the other native vertebrate and invertebrate species of Guam (USFWS 1996c). It is of great concern that there have been recent (1991) sightings of brown treesnakes in cargo from Guam on Rota, Tinian, and Saipan. Should this predatory snake become established on any island where megapodes remain, the bird's populations on these islands would be expected to decrease rapidly within a relatively short period of time.

Megapodes are known to occur within the action area. Proposed military training activities on Tinian and FDM are likely to adversely affect Micronesian megapodes.

Tinian monarch (*Monarcha takatsukasae*)

The Tinian monarch, locally known as *Chichirikan Tinian*, is a small (15 cm [6 in]) flycatcher (Dicuridae: Monarchinae) with light rufous underparts, olive-brown upper parts, dark brown wings and tail, and white rump and undertail coverts (Baker 1951). The monarch is endemic to the island of Tinian, CNMI.

The Tinian monarch was originally listed as endangered in 1970 (35 FR 8491) under the authority of the Endangered Species Conservation Act of 1969 (16 U.S.C. 668cc). Critical habitat was not designated for the Tinian monarch. The endangered status of the monarch was continued under the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended. The decision to list the monarch as endangered was based upon an estimate by Gleize (1945) of 40-50 monarchs on Tinian after WW II (52 FR 10890), although it is not clear if his report was an estimate of the number of birds he saw, or an estimate of the entire population. About the same time as Gleize, Downs (1946) reported that monarchs were restricted in distribution to distinct locations on the island, while Marshall (1949) considered the monarch to be abundant.

In the late 1970s, Pratt *et al.* (1979) estimated monarchs to number in the tens of thousands. In 1982, the U.S. Fish and Wildlife Service (Service) conducted forest bird surveys of the southern islands in the Mariana archipelago. They found the monarch to be the second most abundant species on Tinian with a population estimate of 40,000, ubiquitously distributed throughout the island and across all forested habitat types (Engbring *et al.* 1986). Engbring *et al.* (1986) recommended the reassessment of the monarch's endangered status. This reassessment led to the reclassification of the Tinian monarch from endangered to threatened in 1987 (52 FR 10890).

Between 1994 and 1995 the Service conducted a life history study of the Tinian monarch and reported a population estimate of 52,904 monarchs. The Service found that the monarch was

successfully foraging and breeding in secondary and tangantangan forests throughout the island and recommended that the threatened status of the monarch be reassessed (USFWS 1996c).

Subsequently, a survey of the avifauna of Tinian was conducted in 1996 by the Service following the methodology of the 1982 surveys for comparative purposes. The 1996 survey estimated the monarch population at 55,721 birds, significantly higher than the 1982 estimates (Lusk *et al.* 1997). The 1996 survey also found that vegetation density had significantly increased from 1982 levels. This may be related to a marked decrease in grazing pressure in recent years (Lusk *et al.* 1997). It is hypothesized that the increase in the Tinian monarch population is related to the increase in density of both native and introduced forest habitat types, which may represent an increase in monarch habitat quality (Lusk *et al.* 1997). Currently, the Service is considering removal of the Tinian monarch from the list of endangered and threatened species.

Tinian monarchs inhabit a variety of forest types on Tinian, including native limestone forest (dominated by such species as *Ficus* spp., *Elaeocarpus joga, Mammea odorata, Guamia mariannae, Cynometra ramiflora, Aglaia mariannensis, Premna obtusifolia, Pisonia grandis, Ochrosia mariannensis, Neisosperma oppositifolia, Intsia bijuga, Melanolepis multiglandulosa, Eugenia* spp., *Pandanus* spp., *Artocarpus* spp., and *Hernandia* spp.), secondary vegetation (consisting primarily of *Acacia confusa, Albizia lebbeck, Casuarina equisetifolia, Cocos nucifera*, and *Delonix regia* mixed with native species), and almost pure stands of introduced *Leucaena leucocephala* (tangantangan) (Engbring *et al.* 1986, USFWS 1996c).

Currently, the vegetation on Tinian is highly disturbed, with the single most predominant habitat type on Tinian being tangantangan thickets (Engbring *et al.* 1986, Falanruw *et al.* 1989, Fosberg 1960). According to Engbring *et al.* (1986), 38 percent of Tinian is dominated by tangantangan, while Falanruw *et al.* (1989) estimated 54 percent of the island to be covered in secondary vegetation, which in her definition included tangantangan thickets. Only five to seven percent of the island is estimated to remain in native forest (Engbring *et al.* 1986, Falanruw *et al.* 1989), which is restricted to steep limestone escarpments (Falanruw *et al.* 1989).

During the study conducted by the Service between 1994 and 1995, information was obtained on the abundance, distribution, and breeding ecology of several species found on Tinian such as the Tinian monarch (USFWS 1996c). It was found that the native limestone forest may be preferred by monarchs over secondary and tangantangan forest types, based on the following: 1) monarch home range sizes were found to be four to five times smaller in native limestone forest than in secondary and tangantangan forests (home range sizes in limestone forest averaged 1,221 square m [1,334 square yards(yds)]), while home range sizes in secondary and tangantangan forest types averaged 5,196 and 6,385 square m (5,679 and

6,979 square yds), respectively, indicating that native forest is higher quality monarch habitat because smaller areas are able to support a monarch home range; 2) 64 percent of all monarch nests were constructed in native tree species; 3) of 114 monarch nests, 62 were found in native forest while only 52 were found in the secondary and tangantangan forest types combined, indicating that monarchs have higher nest densities in native forest; 4) nesting success in native limestone forest was greater than in secondary and tangantangan forest types (of 19 nests that produced nestlings, 13 were in native limestone forest and only 6 were in secondary forest and tangantangan forests combined); and 5) based on resightings of banded birds, monarch densities were found to be four to five times higher in limestone forest than in either secondary or tangantangan forest (30.7 birds/hectare (ha)(76.7 acre), 7.7 birds/ha (19.3 acre), and 6.0 birds/ha (15.0 acre), respectively).

Other information provided by the previously mentioned study has described the Tinian monarch as a forager of the mid-level forest. It perches on relatively slender branches beneath the forest canopy and gleans invertebrates (*e.g.*, moths, butterflies, ants, caterpillars, and several species of long-legged insects) from leaf and bark surfaces. Foraging habits of the Tinian monarch are similar in all three different forest habitats (*i.e.*, limestone forest, secondary forest, and tangantangan).

The Tinian monarch likely breeds year-round. However, peak nesting periods for the Tinian monarch appear to be associated with periods of increased rainfall, which, during the time of the Service's 1994-95 study (USFWS 1996c), occurred during the months of January, May, and September. Tinian monarchs have been observed nesting in three different forest habitats (*i.e.*, native limestone, secondary, and tangantangan). Mean clutch size for the Tinian monarch is two eggs, with an occasional occurrence of one or three eggs (USFWS 1996c).

Likely predators on monarchs and their eggs and nestlings are collured kingfishers (*Halcyon chloris*), Micronesian starlings (*Aplonis opaca*), feral cats (*Felis domesticus*), and the roof rat (*Rattus rattus*) (USFWS 1996c). There is one observation of a monitor lizard (*Varanus indicus*) crawling in a tree with an egg inside its mouth that matched the size and color of a monarch or rufous fantail egg. Another cause of mortality is inclement weather, which has been known to cause a nestling and its nest to fall to the ground when the nest was hit by a large falling branch.

Tinian monarchs are known to occur throughout the action area on Tinian. Therefore, it is likely that the proposed project will adversely affect the Tinian monarch.

III. Environmental Baseline

The environmental baseline describes the status of the species and factors affecting the environment of the species or critical habitat in the proposed action area contemporaneous with the consultation

in process. The baseline usually includes State, local, and private actions that affect a species at the time the consultation begins. Unrelated Federal actions that have already undergone formal or informal consultation are also a part of the environmental baseline. Federal actions within the action area that may benefit listed species or critical habitat are also included in the environmental baseline.

A. Status of the species within the action area

Green sea turtle

Guam: There is some regular low-level nesting of green turtles on Guam (NMFS 1998a). Green sea turtles have been known to nest at Tarague Beach (Wiles *et al.* 1995).

Tinian: Green sea turtles have been observed nesting at Unai Babui, Unai Dankulo, and Unai Chulu (USFWS 1996). There are also records of sea turtles nesting at Kammer Beach in the past (USFWS 1996).

FDM: The action area is the entire island of FDM, which includes two small beaches (both approximately 50 m long by 10 m wide), one on the southwestern corner and one on the northeastern corner of the main body of the island. Following a visit to FDM in 1997, Service biologist Michael Molina determined that the two beaches on FDM likely do not represent suitable nesting habitat for sea turtles, due to the extremely shallow nature of the beaches, the fact that the beaches are entirely or almost entirely overwashed during periods of high tide or swell, and the rocky nature of much of their substrate (BO 1-2-97-F-08). However, according to Gerald Davis of Guam DAWR, two green sea turtle nests were found during surveys of FDM in 1982. Based on this information, the Service has determined that green sea turtles may, in fact, presently nest on FDM.

Hawksbill sea turtle

Guam: Gerald Davis (Guam Department of Wildlife Resources) discovered a hawksbill nesting on Guam in November 1991 (NMFS 1998b) at Sumay Cove Marina. Hawksbill nesting on Guam is rare, although nesting hawksbills leave minimal crawl traces and not all beaches on the island are properly surveyed for nesting sea turtles (NMFS 1998b).

There are no records of hawksbills nesting in the CNMI (NMFS 1998b). This is due to: 1) beaches being scarce on the remote islands in the north of the Mariana Archipelago, 2) the long history of occupation on the more southern islands, and 3) almost no hawksbill nesting surveys of small pocket beaches have been conducted in remote areas of the CNMI. However, the lack of evidence doesn't rule out the possibility of hawksbills nesting at low levels at unknown locations (NMFS 1998b).

Mariana Fruit Bat

Guam: Almost all of the Mariana fruit bats that remain on Guam occur on Andersen AFB at Pati Point and between Ritidian Point to the northern rim of Tarague Basin (Wiles *et al.*

1995) In March 1997, between 300 to 350 bats were observed on Guam (G. Wiles, personal communication 1997). Bats are also known to occur in the limestone forest areas between Mount Almagasa and East Tower and in the western portion of the Ordnance Annex (Belt Collins 1998).

Rota: There are a total of 1,000 bats on Rota (Worthington and Taisacan 1996). Probably no bats are found in the proposed action area.

Tinian: Between 25 to 125 Mariana fruit bats have been observed on Tinian (Lemke 1984; Wiles 1996, Worthington and Taisacan 1996), but its residence status on Tinian is uncertain (Marshall *et al.* 1995b). The Mariana fruit bat has been observed roosting in large trees surrounding Lake Hagoi and along the cliffline and forest plateau south of Lake Hagoi, near Mount Lasso (Belt Collins 1998). Bats have also been seen near the West Tinian Airport and the Carolinas Ridge (Belt Collins 1998).

FDM: Two fruit bats were observed roosting in low shrubs on FDM by Tim Sutterfield, Fish and Wildlife Biologist for the Navy, during a site visit in December 1996 (Sutterfield *in lit.* 1997). These two bats probably do not represent a permanent roosting or breeding colony. Although some of the vegetation on the island may provide forage for bats, the low, shrubby nature of the vegetation makes it unlikely that bats utilize FDM for more than a temporary roosting site during travel between larger islands. No roosting or flying bats have been reported from FDM during other site visits or during pre- or post-training helicopter surveys, as would be expected if large numbers of bats were utilizing FDM on a regular basis. The two bats observed on FDM represent a small fraction of the total population for the Mariana islands. Exact take of any fruit bats on the island as the result of aerial and naval bombardment have been indeterminate due to an inability to visit the island.

Micronesian Megapode

Tinian: It is estimated that the remnant population of megapodes on Tinian consists of 10 or fewer individuals (USFWS 1998b). Three confirmed sightings of megapodes were recorded during surveys conducted in 1995, all of which occurred within the Military Leaseback Area (MLA) of Tinian (USFWS 1996c). It is estimated that approximately one-half (5 individuals) to one-third (8 individuals) of the known individuals of megapodes are located within the MLA, which represents less than 1% of the total estimated population within the Marianas archipelago.

FDM: A total of four megapodes were discovered on FDM during a site visit on November 4, 1996 (Lusk and Kessler 1996). Two megapodes were found on the island during a Navy site visit on December 17, 1996 (Figure 2) (Sutterfield *in lit.* 1997). The size of the island, 0.7 km^2, led the Service to estimate that at the time of the 1996 site visit there were likely no more than ten megapodes on the island. This number represents less than 1% of the total estimated population within the Marianas archipelago. Aerial and naval bombardment of the

island since the 1996 site visit has likely decreased the numbers of megapodes on the island, but exact loss of megapodes is indeterminate due to an inability to visit the island. Megapodes may have emigrated to FDM since 1996, or reproduction on the island may have occurred since then, but recruitment levels through either of these avenues has not been determined. With regard to immigration, the island nearest FDM with a substantial megapode population, Anatahan, is approximately 50 miles away. No nesting has been recorded on FDM, but the possibility does exist.

Tinian Monarch
As previously mentioned, the current estimate of the Tinian monarch population is 55,721 birds. Within the action area on Tinian, there are approximately 45,600 monarchs, which represents approximately 82% of the total population.

The northern third of Tinian is used exclusively by the military for training purposes. The central third of Tinian is classified as the Military Lease Area which may be used for military training, but has been leased back to the CNMI government for compatible economic agriculture use and the expansion of the West Tinian Airport. These areas contain three habitat types, native limestone, secondary forest and tangantangan, that support Tinian monarchs.

B. Factors affecting species environment within the action area

Guam
Within the action area on the island of Guam, past and present Federal, State, private, and other human activities that may affect the hawksbill sea turtle, and green sea turtle include military training activities and surveys and habitat improvement projects for the above mentioned species as well as other species. Military activities within the action area on the island of Guam are ongoing. The Service has prepared five previous BOs (1-2-90-F-003, 1-2-92-F-07, 1-2-93-F-14, 1-2-94-F-05, and 1-2-94-F-06) regarding these military activities and their potential to adversely affect the green sea turtle, hawksbill sea turtle, and other listed species. The consultations covered military activities, such as helicopter training, VRC-50 flight squadron field carrier landing practice (FCLP), and the permanent relocation of the VRC-50 Squadron, aircraft training.

No incidental take was anticipated or authorized for the green sea turtle and hawksbill sea turtle for activities on Guam.

A 24-hectare wild game exclosure surrounded by a chain-link fence was constructed by Andersen Air Force Base at Area 50 of Northwest Field to exclude deer and pigs. A bulge barrier has been retrofitted to the fence to prevent brown treesnakes from entering the enclosed area. The intent at this location is to remove all, or nearly all, brown treesnakes from within the plot, and to introduce rare species (*e.g.*, the federally endangered Guam rail)

into the area.

In 1990, Guam Department of Aquatic and Wildlife Resources (GDAWR) began annual crow surveys in northern Guam (*e.g.*, AAFB) to monitor their status (Aguon 1997). Also, efforts to reverse the decline of the Mariana crow began in 1986 with attempts to protect active crow nests from brown treesnake predation. Steel sleeves and an adhesive resin were placed around trunks of active nest trees to act as a snake barrier and snake trapping was begun. Increased nest protection was achieved with the development of electrical barriers and effective snake trapping during the early 1990's. GDAWR also conducts annual monitoring of the Mariana fruit bat colony at Pati Point.

Rota
There have been no activities on Rota that have undergone section 7 consultation that anticipated the incidental take of federally listed species.

Tinian
Within the action area on the island of Tinian, past and present Federal, State, private, and other human activities that may affect the Tinian monarch include military training activities, agricultural and grazing activities, and the expansion of the West Tinian Airport. The Navy has consulted four times (BO's 1-2-84-F-26, 1-2-84-F-44, 1-2-90-F-003, and 1-2-90-F-024) regarding its training activities (*e.g.*, loading and unloading of personnel, supplies, and equipment from C-130 aircraft, clearing of vegetation for establishing bivouac camps, setting up a perimeter defense around camps, firing of weapons at the firing range, and tactical airdrops) within the action area. The consultations resulted in the anticipated incidental take (harassment) of 79 monarchs and loss (harm) of 19 nests (including eggs and young). Also, incidental take was permitted for the harassment of monarchs for ongoing activities such as the Navy's "Kennel Bear" exercises, which occurs twice a year for one to two weeks each time and Marine Corps training, which occurs three times a year for four weeks at a time.

Three other consultations have been conducted with the U.S. Army Corps of Engineers and the U.S. Information Agency for the Tinian Voice of America (VOA) project and the Federal Aviation Administration (FAA) for the expansion of the West Tinian Airport. These consultations anticipated the incidental take for the harm and harassment of 812 Tinian monarchs and the loss (harm) of 681 nests (with young and eggs). The FAA and the CNMI Commonwealth Ports Authority are working with the Tinian Legislature, CNMI DFW, the U.S. Navy, and the Service to set-aside approximately 379 hectares (ha) (937 acres (ac)) of land located to the north of West Tinian Airport to preserve into perpetuity habitat for the Tinian monarch as well as other wildlife and plant species.

FDM
The Navy has consulted five times for aerial bombardment, gunnery training, naval gunfire, and small arms gunfire exercises conducted on FDM (BO's 1-2-97-F-01, 1-2-97-F-05, 1-2-

97-F-08, 1-2-98-F-02, and 1-2-98-F-03). The consultations resulted in the anticipated incidental take of all Micronesian megapodes on the island, three adult green sea turtles and three adult hawksbill sea turtles, 12 active turtle nests, and an indeterminable number of Mariana fruit bats.

The Navy has funded the removal of feral ungulates from the island of Sarigan for the purpose of improving habitat for the Micronesian megapode and Mariana fruit bat.

IV. Effects of the Action

Green Sea Turtle & Hawksbill Sea Turtle
The primary concerns of the Service with regard to the effects of military activities on green sea turtles are (1) direct death of sea turtles on nesting beaches, (2) the destruction of active turtle nests, (3) harassment of sea turtles on nesting beaches, and (4) destruction of nesting habitat.

Mariana Fruit Bat
FDM: The primary concerns of the Service with regard to the effects of ongoing aerial bombardment and small arms gunfire practice on the Mariana fruit bat on FDM are (1) direct death of fruit bats, (2) abandonment of juvenile fruit bats by mothers, and (3) destruction of required foraging and roosting habitat. Although fruit bats are strong fliers and likely to abandon the island once bombardment begins, there remains the probability of death or injury to roosting bats from training activities.

The impact areas for aerial bombardment, naval gunfire, and small arms gunfire cover the entire area of FDM. Therefore, the Service anticipates the possible direct death or injury of fruit bats occurring on the island during the future years of training as proposed.

Micronesian Megapode
Tinian: If megapodes nest on Tinian and either build mounds or burrow between the roots of trees as incubation strategies, there is a potential that troop movements (of up to 2,000 personnel) through limestone forest or adjacent non-native secondary forests could directly affect the megapode by trampling nests that are not seen by personnel.

FDM: The primary concerns of the Service with regard to the effects of ongoing aerial bombardment and small arms gunfire practice on the Micronesian megapode on FDM are (1) direct death of megapodes, (2) destruction or abandonment of active megapode nests, and (3) destruction of required foraging, roosting, and/or nesting habitat. The potential for all of these effects was apparent when on August 2, 1997, the Navy conducted post-bombardment surveys of FDM in accordance with the terms and conditions set forth in the Service's May 16, 1997, biological opinion. As detailed in the Navy's August 21, 1997, memorandum, 25 to 50 new bomb craters were observed and a large section of the central northern portion of

the island, an area believed to represent megapode habitat, was "burned to bare earth" (Kaku *in lit.* 1997). The Service believes the August 2, 1997, survey to be representative of the type of damage that can occur during aerial bombardment, naval gunfire, and/or from small arms fire such as grenade launchers or anti-tank rockets.

The impact areas for aerial bombardment, naval gunfire, and small arms gunfire cover the entire area of FDM. Therefore the Service anticipates the possible direct death of any remaining megapodes and destruction of their nests occurring on the island during the future years of training on FDM.

Tinian Monarch
Ongoing and proposed field maneuver training on Tinian ranges from basic land navigation and cross-country movement skills for individuals (use of a map, compass, and Global Positioning System (GPS)) through exercises for up to 1,000 or more participants combining many offensive and defensive maneuvers and logistics support. Large-scale activities will occur a maximum of three times per year, for up to three weeks each time, whereas training for individuals may occur daily, weekly, or on a monthly basis. These activities can occur in areas that contain limestone forest, secondary forest, and tangantangan forest, all of which support Tinian monarchs.

Tinian monarchs are known to nest throughout the action area. Due to the number of people that will be traveling though the area during the day or night and the fact that Tinian monarch nests are found mid-level in trees, there is potential for soldiers moving through the area to directly affect monarchs by knocking nests out of trees.

V. Cumulative Effects

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. There are no known future State, local, or private actions that are reasonably certain to occur in the action area.

VI. Conclusion

After reviewing the current status of the green sea turtle, hawksbill sea turtle, Micronesian megapode, and the Tinian monarch, the environmental baseline of these species in the action area, and the effects of the proposed action, including cumulative effects, it is the Service's biological opinion that the proposed military training activities are not likely to jeopardize the continued existence of these species. No critical habitat has been designated for these species; therefore, none will be affected.

After reviewing the current status of the Mariana fruit bat (within the CNMI), the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's conference opinion that these military training activities, as proposed, is not likely to jeopardize the continued existence of the proposed Mariana fruit bat. No critical habitat has been proposed, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Department of Defense so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The Department of Defense has a continuing duty to regulate the activity covered by this incidental take statement. If the Department of Defense (1) fails to assume and implement the terms and conditions or (2) fails to require adherence to the terms and conditions of the incidental take statement through enforceable terms that are added to a permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Department of Defense or (applicant) must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement (50 CFR 402.14(I)(3)).

Amount or extent of take anticipated for listed species

Guam

Hawksbill sea turtle: The Service has determined that hawksbill sea turtles may be incidentally taken during amphibious landing training (*e.g*, AAV and LCU) near Sumay Cove, if such training is conducted during the nesting period, which could occur year round (NMFS 1998b). Specifically, incubating eggs may be inundated with water from wind and wave action from amphibious vehicles landing on the boat ramp at the Sumay Cove Mariana. The incidental take is expected to be in the

form of the loss of one turtle nest (eggs and associated hatchlings) per year.

Tinian

Green sea turtle: The Service has determined that green sea turtles may be incidentally taken during the amphibious landing training (*e.g.*, LCAC, AAV, and LCU) proposed at Unai Chulu, Unai Dankulo, and Unai Babui if such training occurs during the nesting season. Specifically, incubating eggs may be crushed by the landing craft or by off-loaded vehicles; vehicle tracks in the sand may prevent hatchlings from reaching the ocean; and activities on or near the beach may prevent turtles from nesting on the beach. The incidental take is expected to be in the form of the loss of one turtle nest (eggs and associated hatchlings) per nesting season.

The Service is concerned that if a nest is not found prior to a landing that it could be crushed and any eggs or hatchlings within or near the nest could be affected.

Tinian monarch: The Service has determined that Tinian monarchs may be incidentally taken during troop movements of 10 or more personnel occurring within monarch habitat during peak nesting periods, which is during the months of January, May, and September as associated with periods of increased rainfall (USFWS 1996a). The Service estimates that 1% of the troops moving through the forest, especially at night, could inadvertently knock a monarch nest out of the nest tree and result in the take of a egg or a chick. The incidental take is expected to be in the form of the loss of a combination of 60 eggs or chicks per year.

Micronesian megapode: The Service's primary concern is that troops moving through the forest, especially at night, may inadvertently step on and crush a megapode nest. The incidental take is expected to be in the form of the loss of one megapode nest, and any associated eggs per year.

FDM

Green sea turtle: Military training activities on FDM from the year 2001 and into the future are anticipated to result in the take of green sea turtles. The incidental take is expected to be in form of the loss of one nest per year from bombing and gunnery practice on FDM.

Micronesian megapode: The Service believes that the two military exercises, which occurred from July 21 to August 1, 1997, and from September 12 to 13, 1997, may have resulted in the taking of all megapodes that occurred on FDM at the time of the bombing and gunnery practice. Such taking likely took the form of direct death or injury, harm and harassment. We therefore believe that the levels of incidental take authorized in biological opinion #1-2-97-F-05 and biological opinion #1-2-97-F-08 have likely been met. The military exercise covered under the December 30, 1997, biological opinion (#1-2-98-F-02) was not conducted. We anticipate that any megapodes still present on FDM, or that may colonize the island prior to the onset of any of the military exercises covered under biological opinion #1-2-98-F-03, which covers the time period of May 1, 1998 to May

1, 2001, may also be incidentally taken.

Under this consultation, military training activities on FDM from the year 2001 and into the future are anticipated to result in the take of Micronesian megapodes. The incidental take is expected to be in form of the death of one megapode per year from bombing and gunnery practice on FDM.

Amount or extent of take anticipated for proposed species

FDM

Mariana fruit bat: For previous consultations for military training activities on FDM, it was anticipated that any bats present on the island at the time of commencement of military activities covered under the above timeline would also be incidentally taken. Under this consultation, military training activities on FDM from the year 2001 and into the future are anticipated to result in the take of Mariana fruit bats. The Service is concerned that if fruit bats are present on FDM, they will be hit by the ammunition used for training. The incidental take is expected to be in form of the death or injury of one adult or juvenile Mariana fruit bat per year from bombing and gunnery practice on FDM.

Effect of the take

In the accompanying biological opinion/conference report, the Service determined that this level of anticipated take is not likely to result in jeopardy to the green sea turtle, hawksbill sea turtle, Micronesian megapode, Mariana fruit bat, and Tinian monarch or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures for Listed Species

The Service believes the following reasonable and prudent measure(s) are necessary and appropriate to minimize impacts of incidental take of green sea turtles, hawksbill sea turtles, Micronesian megapodes, and Tinian monarchs.

1. Minimize the loss of nests, eggs, and hatchlings of green sea turtles on the islands of Tinian and FDM.

2. Minimize the loss of nests, eggs, and hatchlings of hawksbill sea turtles at Sumay Cove, Guam.

3. Minimize the loss of eggs of megapodes on Tinian and adult and juvenile megapodes and any nests on FDM.

5. Minimize the loss of eggs and chicks of Tinian monarchs on Tinian.

Terms and Conditions for Listed Species

In order to be exempt from the prohibitions of section 9 of the Act, the Department of Defense must comply with the following terms and conditions, which implement the reasonable and prudent

measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

In order to address reasonable and prudent measure #1, the following terms and conditions apply:

1a) Minimize amphibious landing exercises on Tinian and aerial bombardment, gunnery training, naval gunfire, and small arms gunfire exercises conducted on FDM during the green sea turtle nesting period (January to October);

1b) Report to the Service within one month of the completion of amphibious vehicle landings on known turtle nesting beaches on Tinian the amount or extent of take of green sea turtles that has occurred as a result of implementation of the proposed action; and

1c) Report to the Service within one month of the completion of aerial bombardment, gunnery training, naval gunfire, and small arms gunfire exercises on FDM the amount or extent of take of green sea turtles or their nests that has occurred as a result of implementation of the proposed action.

In order to address reasonable and prudent measure #2, the following terms and conditions apply:

2a) For AAV and LCU landings at Sumay Cove, Guam, conduct the mitigation/minimization measures as stated in the project description section of the BO for amphibious landing exercises.

2b) Temporarily cease amphibious landing exercises will be temporarily ceased at any given time that there is a sea turtle or nest present within Sumay Cove, Guam until the turtle or nest is not in harm's way;

2c) Minimize amphibious landing exercises at Sumay Cove, Guam, during the hawksbill sea turtle nesting period; and

2d) Report to the Service within one month of the completion of amphibious vehicle landings at Sumay Cove, Guam, the amount or extent of take of hawksbill sea turtles that has occurred as a result of implementation of the proposed action.

In order to address reasonable and prudent measure #3 the following terms and conditions apply:

3a) On FDM, the military shall restrict its impact zone to the central interior portion and/or southern tip of the island and western cliff faces, to the extent possible;

3b) The use of cluster bombs shall be prohibited in training on FDM; and

3c) The Department of Defense shall report within one month of completion each time military training activities have taken place on FDM on the amount or extent of take of megapodes and fruit bats that has occurred as a result of implementation of the proposed action.

In order to address reasonable and prudent measure #4 the following terms and conditions apply:

4a) On Tinian, limit the amount of troop movements occurring at night through Tinian monarch habitat during peak breeding season, which is during the months of January, May, and September as associated with periods of increased rainfall (USFWS 1996a), and through limestone forest and adjacent secondary forest during the Micronesian megapode nesting season;

4b) Avoid conducting troop movements within monarch nesting habitat during the peak nesting season for monarchs; and

4c) Report to the Service on an annual basis (by December 31) regarding troop movements on Tinian and the amount or extent of take of Tinian monarchs or Micronesian megapodes that has occurred as a result of implementation of the proposed action. The reports should be sent to the Pacific Islands Manager, U.S. Fish and Wildlife Service, 300 Ala Moana Boulevard, Room 3-122, Box 50088, Honolulu, Hawaii, 96850.

The following term and condition applies to each species in which incidental take has been permitted:

5) Any injured or dead listed birds, mammals or reptiles found during any of the proposed and ongoing military training activities in the Mariana Archipelago should be reported to the Service's Law Enforcement Office in Guam, Guam Department of Aquatic and Wildlife Resources (GDAWR), and the CNMI DFW. Care instructions will be provided regarding any sick or injured listed species. If dead individuals are found, the Service's Law Enforcement Office in Guam should be notified within one working day. Dead listed species should be wrapped in aluminum foil and refrigerated (dead birds should not be wrapped in plastic or placed in a freezer) and then given to the Service's staff for disposition. The Service's Law Enforcement Office will provide further instructions on the proper disposal of the animals, including shipping requirements to facilities to determine cause of death, if the cause is not known. The Service's Law Enforcement Office in Guam (U.S. Fish and Wildlife Service, P.O. Box 23774, GMF, Barrigada, Guam, 96921; telephone: 671/472-7151), the Pacific Islands Ecological Services Office in Honolulu (U.S. Fish and Wildlife Service, 300 Ala Moana Boulevard, Room 3-122, Box 50088, Honolulu, Hawaii, 96850; telephone: 808/541-3441), GDAWR (192 Dairy Road, Manglao, GU 96923, 671/735-3957),and the CNMI DFW (P.O. Box 10007, Saipan, MP, 96950; telephone: 670/322-9628) should be provided with a written report describing the events surrounding the demise or

injury of the species, if known, and measures must be taken to prevent further injuries or deaths.

Reasonable and Prudent Measures for Proposed Species

The prohibitions against taking the species found in section 9 of the Act do not apply until the species is listed. However, the Service advises the Department of Defense to consider implementing the following reasonable and prudent measures. If this conference report is adopted as a biological opinion following a listing or designation, these measures, with their implementing terms and conditions, will not be discretionary.

1. Minimize the loss of adult and juvenile Mariana fruit bats on FDM.

Terms and Conditions for Proposed Species

In order to be exempt from the prohibitions of section 9 of the Act, the Department of Defense must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary

In order to address reasonable and prudent measure #1 the following terms and conditions apply:

1a) On FDM, the military shall restrict its impact zone to the central interior portion and/or southern tip of the island and western cliff faces, to the extent possible;

1b) The use of cluster bombs shall be prohibited in training on FDM; and

1c) The Department of Defense shall report within one month of completion each time military training activities have taken place on FDM on the amount or extent of take of megapodes and fruit bats that has occurred as a result of implementation of the proposed action.

In summary, the Service anticipates that no more than two nests of green sea turtles per nesting season (one nest on Tinian and one nest on FDM), one hawksbill sea turtle nest per year on Guam, 60 eggs or chicks per year of Tinian monarchs, one Micronesian megapode egg per year on Tinian, one megapode per year on FDM, and one Marina fruit bat per year on FDM will be incidentally taken as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Brown Treesnake Control/Interdiction Plan for Military Training Exercises (BTS Plan) and the U.S. Department of Agriculture, Wildlife Services (WS), Brown Treesnake Control Procedures In Support of Scheduled Military Training Exercises, are located in Appendices E-1 and E-2 respectively of the DEIS. These documents describe various proposed measures to prevent the export of the brown treesnake from Guam to other Mariana and Pacific islands and the U.S. Mainland. However, the plans are several years old and some of the protocols in them have become outdated. The Service recommends that the BTS Plan be updated by consolidating the most effective protocols regarding prevention and control of the brown treesnake in order to avoid any confusion by those carrying out the measures. Comments regarding the design and implementation of the revised BTS Plan should be solicited from WS, DFW, the Biological Resources Division of the U.S. Geological Survey (BRD), and the Service. Also, the effectiveness of the BTS Plan should be assessed periodically by involving external expertise on snake control techniques and strategies. As new information and techniques become available, the BTS Plan should be updated.

The Service recommends that the DOD consider funding the following conservation and recovery projects for threatened and endangered species found within the Mariana Islands: (1) efforts to eradicate feral ungulates on uninhabited northern islands, (2) surveys to assess status, distribution, and nesting/roosting areas of threatened or endangered species, (3) basic research into the life history and demography of threatened or endangered species, and (4) rat (*Rattus* spp.) eradication on uninhabited northern islands.

In addition to FDM providing habitat for the green sea turtle, Micronesian megapode, and Mariana fruit bat, FDM also supports colonies of breeding seabirds, including masked boobies (*Sula dactylatra*), brown boobies (*Sula leucogaster*), red-footed boobies (*Sula sula*), great frigatebirds (*Fregata minor*), common noddies (*Anous stolidus*), black noddies (*Anous minutus*), and white terns (*Gygis alba*). FDM is particularly important for great frigatebirds as it is one of only two small breeding colonies known to exist in the Mariana island chain, and for masked boobies because it represents the largest known nesting site for this species in the Mariana or Caroline islands. Although none of these birds are listed under the Act, they are protected under the Migratory Bird Treaty Act of 1918 [16 U.S.C. 703-712; 40 Stat. 755], as amended. The Service recommends that the Navy concentrate impacts within the interior portion of the island to lessen harm to nesting and roosting seabirds and that bombing activities be limited to low periods in the seabird breeding season. Also, the Navy should establish a long-term monitoring program to evaluate the effects of aerial bombing and naval gunnery on seabird populations.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

Conclusion

The Service has determined the military activities carried out by the Department of Defense on Guam, Rota, FDM, and Tinian, as described in the DEIS are not likely to jeopardize the continued existence of the green sea turtle, hawksbill sea turtle, Mariana fruit bat, Micronesian megapode, and the Tinian monarch.

This concludes formal consultation and conference on the actions outlined in the request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

You may ask the Service to confirm the conference report as a biological opinion issued through formal consultation if the Marianas fruit bat is listed within the CNMI. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the Service will confirm the conference report as the biological opinion of the project and no further section 7 consultation will be necessary.

After listing of the Mariana fruit bat in the CNMI as endangered/threatened and/or designation of critical habitat for the Mariana fruit bat and any subsequent adoption of this conference report, the Federal agency shall request reinitiation of consultation if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect the species or critical habitat in a manner or to an extent not considered in this conference report; (3) the agency action is subsequently modified in a manner that causes an effect to the species or critical habitat that was not considered in this conference report; or (4) a new species is listed or critical habitat designated that may be affected by the action.

The incidental take statement provided in this conference report does not become effective until the species is listed and the conference report is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the Mariana fruit bat within the CNMI has occurred. Modifications of the report and incidental take statement

may be appropriate to reelect that take. No take of the Mariana fruit bat in the CNMI may occur between the listing of the species and the adoption of the conference report through formal consultation, or the completion of a subsequent formal consultation.

This BO and formal conference report satisfies section 7 requirements of the Act. However, it does not cover requirements pertaining to wildlife and plant species under local territorial or commonwealth laws and regulations.

If you have any questions concerning this biological opinion or conference report, please contact Assistant Field Supervisor Karen Rosa or Fish and Wildlife Biologists Leila Gibson (telephone: 808/541-3441; facsimile: 808/541-3470).

Sincerely,

Robert P. Smith

Robert P. Smith
Pacific Islands Manager

LITERATURE CITED

Anonymous. 1984. Oxford University expedition to the Mariana Islands. Bulletin of Oxford University Exploration Club 7: 73-84.

Aguon, C. F. 1997. Survey for Mariana crows and their nest sites. In: Job Progress Reports - Federal Aid in Wildlife Restoration, Division of Aquatic and Wildlife Resources, Guam.

Baker, R.H. 1951. The avifauna of Micronesia, its origin, evolution, and distribution. Univ. Kansas Publ., Mus. Nat. Hist. 3: 1-359.

Belt Collins. 1998. Draft Environmental Impact Statement (DEIS) Military Training in the Marianas. U.S. Pacific Command.

Clark, G.A. 1964. Life histories and the evolution of megapodes. Living Bird 3: 149-167.

Coultas, W.F. 1931. Whitney south sea expedition journals, Vo. W. Journal and letters, Vol. II, of William F. Coultas, November 1930 to December 1931. American Museum of Natural History, New York. Unpublished. 290 pp.

Cox, P., T. Elmqvist, E. Pierson, and W. Rainey. 1992. Flying Foxes as pollinators and seed dispersers in Pacific island ecosystems. In: Wilson, D. E. and G. L. Graham (eds.), Pacific Island Flying Foxes: Proceedings of an International Conservation Conference. U.S. Fish and Wildlife Service Biological Report 90(23):18-23.

Craig, R.J., R. Chandran, and A. Ellis. 1992. Bird populations on Aguiguan: a ten year update. In Craig, R.J. (ed.) The Aguiguan Expedition. Proceedings: Marianas Research Symposium 1: 8-15. Northern Mariana College, Saipan.

Crome, F.H.J. and H.E. Brown. 1979. Notes on the social organization of the orange-footed Scrubfowl *Megapodius reinwardt*. Emu 79: 111-119.

Dekker, R.W.R.J. 1989. Predation and the western limits of megapode distribution (Megapodiidae: Aves). J. Biogeography 16: 317-321.

Dekker, R.W.R.J. 1992. Status and distribution of the Nicobar megapode *Megapodius nicobariensis abbotti* on Great Nicobar, India. Unpubl. Rept. National Museum of Natural History, Leiden, the Netherlands.

Dekker, R.W.R.J. and T.G. Brom 1992. Megapode phylogeny and the interpretation of incubation strategies. Pp. 19-31 in Dekker, R.W.R.J. and D.N. Jones (eds.) Proceedings of the First International Megapode Symposium, Christchurch, New Zealand, December 1990. Zoologische Verhandelingen 278: 1-78. Leiden.

Downs, T. 1946. Birds on Tinian in the Marianas. Trans. Kansas Acad. Sci., 49:87-106.

Engbring, J., F.L. Ramsey, and V.J. Wildman. 1986. Micronesian forest bird survey, 1982: Saipan, Tinian, Aguijan, and Rota. U.S. Fish and Wildlife Report, Honolulu, HI. 143 pp.

Falanruw, M.C.V. 1975. Distribution of the Micronesian Megapode *Megapodius laperouse* in the Northern Mariana Islands. Micronesica 11: 149-150.

Falanruw, M.C., T.G. Cole, and A.H. Ambacker. 1989. Vegetation survey of Rota, Tinian, and Saipan, Commonwealth of the Northern Mariana Islands. USDA Forest Service Resource Bulletin PSW-27.

Fancy, S.G., R.J. Craig, and C.W. Kessler. (In review). Forest bird and fruit bat populations on Sarigan, Mariana Islands.

Fosberg, F.R. 1960. *Serianthes* Benth. (Leguminosae-Mimosoideae-Ingeae). Reinwardtia 5: 293-317.

Glass, P.O. and D.T. Aldan. 1988. Micronesian Megapode Surveys and Research. Pp. 131-153 in Division of Fish and Wildlife Progress Report: 1982-1987. CNMI Division of Fish and Wildlife, Saipan.

Glass, P. and E.M. Taisacan. 1988. Marianas fruit bat surveys and research. Pp. 1-22 *in* Five Year Progress Report, Fiscal Year 1982-87. Pittman-Robertson Federal Aid in Wildlife Restoration Program. Division of Fish and Wildlife, Commonwealth of the Northern Mariana Islands.

Glass, P.O. and E.C. Villagomez. 1986. Trip Report: Guguan, 8-20 September. CNMI Division of Fish and Wildlife, Saipan.

Gleize, D.A. 1945. Birds of Tinian. Bull. Mass. Audubon Soc. 29: 220.

Jones, D.N., R.W.R.J. Dekker, and C.S. Roselaar. 1995. The Megapodes. Oxford: Oxford University Press.

Kessler, C. 1997. Feral animal monitoring and management. Pp. 8-14 *in* Annual Progress Report, Fiscal Year 1996. Pittman-Robertson Federal Aid in Wildlife Restoration Program. Division of Fish and Wildlife, Commonwealth of the Northern Mariana Islands.

Lemke, T.O. 1984. Marianas fruit bat surveys and inventories. Pp 3-16 *in* Annual Report, Fiscal Year 1984. Pittman-Robertson Federal Aid in Wildlife Restoration Program. Division of Fish and Wildlife, Commonwealth of the Northern Mariana Islands.

Lemke, T.O. 1986. Petition to list the Marianas fruit bat (*Pteropus mariannus mariannus*) as an endangered species in the Commonwealth of the Northern Mariana Islands. Unpublished.

Lemke, T.O. 1992. Status of the Marianas fruit bat (Pteropus mariannus) in the Northern Mariana Islands north of Saipan. In: Wilson, D.E. and G.L. Graham (eds.), Pacific Island Flying Foxes: Proceedings of an International Conservation Conference. U.S. Fish and Wildlife Service Biological Report 90(23):68-73.

Ludwig, G.M. 1979. Fish and Wildlife Concerns and Recommendations for Northern Marianas Islands based on July 1978 Field Trip. Unpublished report, U.S. Fish and Wildlife Service, Honolulu.

Lusk, M. 1993. Field Trip Report: Aguiguan, 23-26 August. CNMI Division of Fish and Wildlife, Saipan.

Lusk, M and C. Kessler. 1996. Trip Report: Farallon de Medinilla, 3-4 November. U.S. Fish and Wildlife Service, Pacific Island Ecoregion, Honolulu, HI.

Lusk, M.R., S. Hess, M. Reynolds, and S. Johnston. 1997. Population status of the Tinian monarch (*Monarcha takatsukasae*) from the island of Tinian, Commonwealth of the Northern Mariana Islands. U.S. Fish and Wildlife Service report. 12 pp.

Marshall, A.P., D.J. Worthington, G.J. Wiles, D.J. Grout, C.C. Kessler, V.A. Camacho, E.M. Taisacan, and T. Rubenstein. 1995b. A survey of the Mariana fruit bat (*Pteropus mariannus*) on Anatahan, Commonwealth of the Northern Mariana Islands, July, 1995., Division of Fish and Wildlife, Commonwealth of the Northern Mariana Islands. Unpublished report. 28 pp.

Marshall, J.T., Jr. 1949. The endemic avifauna of Saipan, Tinian, Guam, and Palau. Condor 51:200-221.

National Marine Fisheries Service & U.S. Fish and Wildlife Service. 1998a. Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*). National Marine Fisheries Service, Silver Spring, MD.

National Marine Fisheries Service & U.S. Fish and Wildlife Service. 1998b. Recovery Plan for U.S. Pacific Populations of the Hawksbill Turtle (*Eretmochelys imbricata*). National Marine Fisheries Service, Silver Spring, MD.

Olson, S.L. 1980. The significance of the distribution of the Megapodiidae. Emu 80: 21-24.

Oustalet, M.E. 1896. Les mammiferes et les oiseaux des Iles Mariannes. Nouv. Arch. Mus. Nat. Paris, Ser. 3,8: 24-74.

Owen, B. 1974. Environmental impact study on the terrestrial fauna and flora of Tinian with respect to the proposed establishment of a U.S. miltary base on that island. Unpubl. Rept., Trust Territory Conservation Office (cited in Glass and Aldan 1988).

Pierson, E. and W. Rainey. 1992. The biology of flying foxes of the genus *Pteropus*: A Review. *In* Wilson, D.E. and G.L. Graham (eds.), Pacific Island Flying Foxes: Proceedings of an International conservation Conference. U.S. Fish and Wildlife Service Biological Report 90(23): 1-17.

Pratt, H.D., P. L. Brunner, and D. G. Berrett. 1979. America's unknown avifauna: the birds of the Mariana Islands. American Birds 33(3):227-235.

Pratt, H.D., J. Engbring, P.L. Bruner, and D.G. Berrett. 1980. Notes on the taxonomy, natural history, and status of the resident birds of Palau. Condor 82: 117-131.

Pratt, H.D., P.L. Bruner, and D.G. Berrett. 1987. A Field Guide to the Birds of Hawaii and the Tropical Pacific. Princeton: Princeton University Press.

Reichel, J.D. and P.O. Glass. 1988. Field Trip Report: Anatahan, 27-29 September. CNMI Division of Fish and Wildlife, Saipan.

Reichel, J.D., S. Taisacan, and P.O. Glass. 1988. Field Trip Report, Northern Islands, 27 May - 5 June. CNMI Division of Fish and Wildlife, Saipan.

Rice, C.G. and D.W. Stinson. 1992. Field Trip Report: Chiba Institute Northern Islands Trip, 11-20 May, 24 May-9June. CNMI Division of Fish and Wildlife, Saipan.

Rice, C.G., D.W. Stinson, and R.J. Craig. 1990. Field Trip Report, Sarigan, 18-22 September. CNMI Division of Fish and Wildlife, Saipan.

Stinson, D.W. 1993a. Micronesian Megapode Research. Pp. 217-233 in Division of Fish and Wildlife Research and Management Program, Progress Report: 1987-1992. CNMI Division of Fish and Wildlife, Saipan.

Stinson, D.W. 1993b. Northern Marianas. *In*: Scott, D.A. (ed.). A directory of wetlands in Oceania: 263-283. IWRB, Slimbridge, U.K. and AWB, Kuala Lumpur, Malaysia. 444 pp.

Takatsukasa, S. 1932-1938. The Birds of Nippon. London: H.F. & G. Witherby.

Todd, D. 1983. Pritchard's Megapode on Niaufo'ou Island, Kingdom of Tonga. Journal of the World Pheasant Assoc. 8: 69-88.

U.S. Fish and Wildlife Service. 1990. Guam Mariana fruit Bat and Little Mariana Fruit Bat Recovery Plan. Portland, Oregon. 57 pp. + Appendix.

U.S. Fish and Wildlife Service. 1991. Recovery Plan for the Mariana Islands Population of the Vanikoro Swiftlet, *Aerodramus vanikorensis bartschi*. U.S. Fish and Wildlife Service, Portland, OR. 49 pp.

U.S. Fish and Wildlife Service. 1993. Recovery Plan for *Serianthes nelsonii*. U.S. Fish and Wildlife Service, Portland, OR. 60 pp.

U.S. Fish and Wildlife Service. 1996a. Characteristics of Mariana common moorhens and wetland habitats within the U.S. Department of Navy's Military Lease Area and Exclusive Military Use Area on the Island of Tinian, Commonwealth of the Northern Mariana Islands. U.S. Fish and Wildl. Serv., Div. Ecol Serv., Honolulu, HI. 32 pp + photos.

U.S. Fish and Wildlife Service. 1996b. U.S. Fish and Wildlife Service Research Report Part III: Status and distribution of marine turtles on the Island of Tinian, CNMI - 1994 & 1995. U.S. Fish and Wildlife Service, Honolulu, HI. 37 pp.

U.S. Fish and Wildlife Service. 1996c. Wildlife research report for navy-leased lands on the island of Tinian, CNMI. Prepared for Department of the Navy, PACNAVFACENGCOM, Pearl Harbor, HI. 100 pp.

U.S. Fish and Wildlife Service. 1998a. Endangered and threatened wildlife and plants: proposed reclassification from endangered to threatened status for the Mariana fruit bat from Guam, and proposed threatened status for the Mariana fruit bat from the Common wealth of the Northern Mariana Islands. 63 FR 14641.

U.S. Fish and Wildlife Service. 1998b. Recovery Plan for the Micronesian Megapode (*Megapodius laperouse laperouse*). U.S. Fish and Wildlife Service, Portland, OR. 65 + pp.

Wiles, G.J. 1987a. Current research and future management of Mariana fruit bats (Chiroptera: Pteropodidae) on Guam. Australian Mammalogy 10: 93-95.

Wiles, G.J. 1987b. The status of fruit bats on Guam. Pacific Science 41: 148-157.

Wiles, G.J. 1996. Current status, distribution, and natural history of Marianas fruit bats (1410, 1440, 1450). In: Annual Report, Fiscal Year 1996. Pittman-Robertson Federal Aid in Wildlife Restoration Program. Division of Aquatic and Wildlife Resources, Guam.

Wiles, G. J. and P. Glass. 1990. Interisland movements of fruit bats (Pteropus mariannus) in the Mariana Islands. Atoll Research Bulletin 343: 1-6.

Wiles, G.J., C.F. Aguon, G.W. Davis, and D.J. Grout. 1995. The status and distribution of endangered animals and plants in northern Guam. Micronesia 28:31-49.

Wiles, G.J., T.O. Lemke, and H.H. Payne. 1989. Population estimates of fruit bats (*Pteropus mariannus*) in the Mariana Islands. Conservation Biology 3: 66-76.

Worthington, D.J. and E.M. Taisacan. 1995. Fruit bat research. Pp. 5-12 *in* Annual Report, Fiscal Year 1994. Pittman-Robertson Federal Aid in Wildlife Restoration Program. Division of Fish and Wildlife, Commonwealth of the Northern Mariana Islands.

Worthington, D.J. and E.M. Taisacan. 1996. Fruit bat research. Pp. 6-17 *in* Annual Report, Fiscal Year 1995. Pittman-Robertson Federal Aid in Wildlife Restoration Program. Division of Fish and Wildlife, Commonwealth of the Northern Mariana Islands.